

ELEMENTARY CORE Academy

UTAH STATE OFFICE OF EDUCATION & UTAH STATE UNIVERSITY



2008 Participant Handbook

UTAH STATE
OFFICE OF



UtahState
UNIVERSITY

ELEMENTARY CORE ACADEMY

6517 Old Main Hill
Logan, UT 84322-6517

435-797-0939
<http://coreacademy.usu.edu>

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ISBN: 1-890563-61-7

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Acknowledgements

These materials have been produced by and for the teachers of the State of Utah. Appreciation is expressed to the numerous individuals who provided input and effort into the creation of this curriculum. Delivery of the Elementary CORE Academy, including the development and delivery of content, coordination of sessions, distribution of materials, and participant interaction, has been a collaborative effort of many educational groups across Utah. The following organizations, Utah teachers, and educational leaders contributed ideas and activities as part of this professional development project:

Organizations:

Utah State Office of Education (USOE)
Utah State University (USU)
State Science Education Coordination Committee (SSECC)
State Mathematics Education Coordination Committee (SMECC)
Special Education Services Unit (USOE)

Individuals:

Academy Coordination Committee: Janet Gibbs, Velma Itamura, Max Longhurst, Nicole Paulson,

Academy Director: Max Longhurst

Academy Coordinator: Ami Israelsen

Academy Facilitators: Pat Drake, Heidi Jensen, Kim Mellor, Phyllis Peterson

Academy Presenters and Contributors: Megan Dahlgren, Karen Haslam, Faith Hedges, Helen Hellstern, Melissa Linford, Becky Moffat

Credits for editing, compiling, formatting, and assisting with the materials and delivery of the Elementary CORE Academy are given to Brynja Kohler and Elizabeth Shaw.

UTAH STATE OFFICE OF EDUCATION

Leadership...Service...Accountability

Patti Harrington, Ed.D. State Superintendent of Public Instruction
Voice: (801) 538-7500 Fax: (801) 538-7521 TDD: (801) 538-7876
250 East Cesar E. Chavez Blvd. (500 South) P.O. Box 144200 Salt Lake City, Utah 84114-4200

Dear CORE Academy Teachers:

Thank you for your investment in children and in building your own expertise as you participate in the Elementary CORE Academy. I hope your involvement helps you to sustain a laser-like focus on student achievement.

Teachers in Utah are superb. By participating in the Academy, you join a host of teachers throughout the state who understand that teaching targeted on the core curricula, across a spectrum of subjects, will produce results of excellence. The research is quite clear—the closer the match of explicit instruction to core standards, the better the outcome on core assessments.

I personally appreciate your excellence and your desire to create wonderful classrooms of learning for students. Thank you for your dedication. I feel honored to associate with you and pledge my support to lead education in ways that benefit all of our children.

Sincerely,



Patti Harrington, Ed.D.
State Superintendent of Public Instruction

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Funding Sources

Appreciation is expressed for the tremendous educational input and monetary commitment of several organizations for the successful delivery of the Elementary CORE Academy. This year's Elementary CORE Academy was developed and funded through a variety of sources. The Utah State Office of Education (USOE), in collaboration with Utah State University (USU) and local school districts of Utah, has supported kindergarten through sixth grade teachers with professional development experiences that will enhance the educational experience for Utah children.

Major funding for the Academy comes from the following sources:

Federal/State Funds:

- Utah State Office of Education
 - Staff Development Funds
 - Special Education Services Unit
- ESEA Title II
- Utah Math Science Partnership

District Funds:

Various sources including Quality Teacher Block, Federal ESEA Title II, and District Professional Development Funds

School Funds:

- Trust land, ESEA Title II, and other school funds
- Utah State Office of Education Special Education Services

The state and district funds are allocations from the state legislature. ESEA is part of the "No Child Left Behind" funding that comes to Utah.

Additionally, numerous school districts, individual schools, and principals in Utah have sponsored teachers to attend the Academy. Other educational groups have assisted in the development and delivery of resources in the Academy.

Most important is the thousands of teachers who take time from their summer to attend these professional development workshops. It is these teachers who make this program possible.

Goals of the Elementary CORE Academy

Overall

The purpose of the Elementary CORE Academy is to create high quality teacher instruction and improve student achievement through the delivery of professional development opportunities and experiences for teachers across Utah.

The Academy will provide elementary teachers in Utah with:

1. Models of exemplary and innovative instructional strategies, tools, and resources to meet the Core Curriculum standards, objectives, and indicators.
2. Practical models and diverse methods of meeting the learning needs of all children, with instruction implementation aligned to the Core Curriculum.
3. Meaningful opportunities for collaboration, self-reflection, and peer discussion specific to innovative and effective instructional techniques, materials, teaching strategies, and professional practices in order to improve classroom instruction.

Learning a limited set of facts will no longer prepare a student for real experiences encountered in today's world. It is imperative that educators have continued opportunities to obtain instructional skills and strategies that provide methods of meeting the needs of all students. Participants of the Academy experience will be better equipped to meet the challenges faced in today's classrooms.

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Kindergarten Core Curriculum

K-2 Core Curriculum

Introduction

Most students enter school confident in their own abilities; they are curious and eager to learn more. They make sense of the world by reasoning and problem solving. Young students are active, resourceful individuals who construct, modify, and integrate ideas by interacting with the physical world as well as with peers and adults. They learn by doing, collaborating, and sharing their ideas. Students' abilities to communicate through language, pictures, sound, movement, and other symbolic means develop rapidly during these years.

Literacy requires an understanding of listening, speaking, reading, writing, and viewing in many forms including print and electronic images. Today, more than ever, students must have the ability to think critically while applying new information to existing knowledge. Therefore, school literacy programs need to involve students in learning to read and write in situations that foster critical thinking and the use of literacy for independent learning in all content areas.

Young students are building beliefs about what mathematics is, about what it means to know and do mathematics, and about themselves as mathematical learners. Mathematics instruction needs to include more than short-term learning of rote procedures. Students must use technology and other mathematical tools, such as manipulative materials, to develop conceptual understanding and solve problems as they do mathematics. Students, as mathematicians, learn best with hands-on, active experiences throughout the instruction of the mathematics curriculum.

Language Arts and Mathematics are the tools for doing work in other areas. These content areas need to be integrated into other curriculum areas to provide students with optimal learning. The curriculum becomes more relevant when content areas are connected rather than taught in strict isolation. For this reason, the content areas of the Fine Arts, Health Education, Physical Education, Science, and Social Studies have been combined to enable teachers to teach more efficiently and students to learn in a real-life context that enhances lifelong learning.

The Kindergarten through Second Grade Core describes what students should know and be able to do at the end of each of the kindergarten, first, and second grade levels. It has been developed, critiqued, and revised by a community of Utah teachers, university

- Young children learn by doing, collaborating, and sharing their ideas.



Organization of the
K-2 Core:

- Intended Learning Outcomes
- Standard
- Objective
- Indicator

educators, the State Office of Education specialist, and an advisory committee representing a wide variety of people from the community. The Core reflects the current philosophy of education that is expressed in national documents developed by the International Reading Association, National Council of the Teachers of Mathematics, National Standards for Arts Education, Information Power, National Association for Sport and Physical Education, American Association for the Advancement of Science, National Council for the Social Studies, International Society for Technology and Education, and Early Childhood Standards.

Organization of the K-2 Core

The Core is designed to help teachers organize and deliver instruction.

- Each grade level begins with a brief course description.
- The Kindergarten, First, and Second Grade INTENDED LEARNING OUTCOMES describe the goals for students to gain knowledge and understand their world. They are found at the beginning of each grade level, are an integral part of the Core, and should be included as part of instruction.
- The first Core area consists of the Language Arts curriculum.
- The second Core area consists of the Mathematics curriculum.
- The third Core area consists of the subject areas of the Fine Arts, Health Education, Physical Education, Science, and Social Studies.
- A STANDARD is a broad statement of what students are expected to understand. Several Objectives are listed under each Standard.
- An OBJECTIVE is a more focused description of what students need to know and be able to do at the completion of instruction. If students have mastered the Objectives associated with a given Standard, they have mastered that Standard at that grade level. Several Indicators are described for each Objective.
- An INDICATOR is a measurable or observable student action that enables one to assess whether a student has mastered a particular Objective. Indicators are not meant to be classroom activities, but they can help guide classroom instruction.

Guidelines Used in Developing the K-2 Core

The Core is:

Consistent With the Nature of Learning

The main intent in the early grades is for students to value learning and develop the skills to gain knowledge and understand their world. The Core is designed to produce an integrated set of Kindergarten, First Grade, and Second Grade Intended Learning Outcomes for students, with specific goals in all content areas.

- By emphasizing depth rather than breadth, the Core seeks to empower students.

Coherent

The Core has been designed so that, wherever possible, the ideas taught within a particular grade level have a logical and natural connection with each other and with those of earlier grades. Efforts have also been made to select topics and skills that integrate well with one another appropriate to grade level. In addition, there is an upward articulation of concepts, skills, and content. This spiraling is intended to prepare students to understand and use more complex concepts and skills as they advance through the learning process.

Developmentally Appropriate

The Core takes into account the psychological and social readiness of students. It builds from concrete experiences to more abstract understandings. The Core focuses on providing experiences with concepts that students can explore and understand in depth to build the foundation for future learning experiences.

Reflective of Successful Teaching Practices

Learning through play, movement, and adventure is critical to the early development of the mind and body. The Core emphasizes student exploration. The Kindergarten, First Grade, and Second Grade Intended Learning Outcomes are central in each standard. The Core is designed to encourage instruction with students working in cooperative groups. Instruction should recognize the importance of each Core area in the classroom, school, and community.

Comprehensive

The Kindergarten, First, and Second Grade Core does not cover all topics that have traditionally been in the Kindergarten, First Grade, and Second Grade curriculum; however, it provides a basic foundation of knowledge and skills in all content areas. By emphasizing depth rather than breadth, the Core seeks to empower students rather than

- Student achievement of the standards and objectives in this Core is best assessed using a variety of assessment instruments.

intimidate them with a collection of isolated and eminently forgettable facts. Teachers are free to add related concepts and skills, but they are expected to teach all the standards and objectives specified in the Core for their grade level.

Feasible

Teachers and others who are familiar with Utah students, classrooms, teachers, and schools have designed the Core. It can be taught with easily obtained resources and materials. A Teacher Handbook is also available for teachers, and has sample lessons on each topic for each grade level. The Teacher Handbook is a document that will grow as teachers add exemplary lessons aligned with the new Core.

Useful and Relevant

This curriculum relates directly to student needs and interests. Relevance of content areas to other endeavors enables students to transfer skills gained from one area of instruction into their other school subjects and into their lives outside the classroom.

Reliant Upon Effective Assessment Practices

Student achievement of the standards and objectives in this Core is best assessed using a variety of assessment instruments. Performance tests are particularly appropriate to evaluate student mastery of thinking processes and problem-solving skills. A variety of classroom assessment approaches should be used by teachers in conjunction with the Criterion Referenced Tests (CRT) that are administered to first and second grade students in Language Arts and Mathematics, and with the pre- and post-tests administered in kindergarten. Observation of students engaged in instructional activities is highly recommended as a way to assess students' skills as well as attitudes toward learning. The nature of the questions posed by students provides important evidence of their understanding.

Engaging

In the early grades, children are forming attitudes and habits for learning. It is important that instruction maximizes students' potential and gives them understanding of the intertwined nature of learning. Effective elementary instruction engages students actively in enjoyable learning experiences. Instruction should be as thrilling an experience for a child as seeing a rainbow, growing a flower, or describing a toad. In a world of rapidly expanding knowledge and technology, all students must gain the skills they will need to understand and function responsibly and successfully in the world. The Core provides skills in a context that enables students to experience the joy of learning.

The Kindergarten Core Curriculum

In kindergarten, core concepts should be integrated across all curriculum areas. Reading, writing, and mathematical skills should be emphasized as integral to the instruction in all other areas. Personal relevance of content is always an important part of helping students to value learning and should be emphasized.

Kindergarten students engage in many activities that help them develop oral language and literacy. Kindergarten students take part in language activities that extend their vocabulary, conceptual knowledge, and phonological awareness. Students learn to follow directions and develop the language of schooling.

Within a well-balanced mathematics curriculum, students understand small numbers, quantities, and simple shapes in their everyday environment. They count, compare, describe and sort objects, and develop a sense of patterns. Students also develop an understanding of measurable attributes of objects.

In kindergarten, students learn about themselves and their relationship to the classroom, school, family, and community. Students are expected to develop skills in posing simple questions, measuring, sorting, classifying, and communicating information about the natural world. Students learn about their bodies and the behaviors necessary to protect them and keep them healthy. They learn basic body control while beginning to develop motor skills and moving in a variety of settings. Students become aware of strength, endurance, and flexibility in different parts of their bodies. They express their thoughts and ideas creatively, while challenging their imagination, fostering reflective thinking, and developing disciplined effort and problem-solving skills.

- Reading, writing, and mathematical skills should be emphasized as integral to the instruction in all other areas.



K-2 Intended Learning Outcomes

- Intended learning outcomes provide a direction for general classroom instruction, management, culture, environment, and inclusion.

The main intent at the early grades is for students to value learning and develop the skills to gain knowledge and understand their world.

The Intended Learning Outcomes described below reflect the belief that kindergarten, first grade, and second grade education should address the intellectual, social, emotional, physical, and ethical development of children. While the Kindergarten, First Grade, and Second Grade Core Curriculum focuses primarily on content and the intellectual development of children, it is important to create a classroom culture that fosters development of many aspects of a person. By nurturing development in these interrelated human domains, young people will be healthy and discover varied and exciting talents and dreams. They will be socially and civically competent and able to express themselves effectively.

The outcomes identified below are to provide a direction for general classroom instruction, management, culture, environment, and inclusion. These outcomes should be interwoven throughout the Kindergarten, First Grade, and Second Grade Core Curriculum, which offers more specific and measurable standards for instruction.

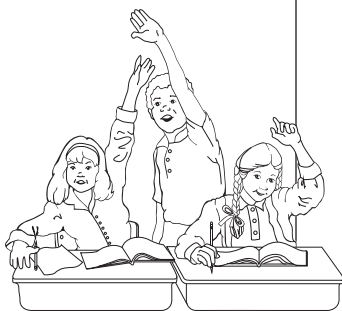
Beginning in kindergarten and by the end of second grade students will be able to:

1. **Demonstrate a positive learning attitude.**

- a. Display a sense of curiosity.
- b. Practice personal responsibility for learning.
- c. Demonstrate persistence in completing tasks.
- d. Apply prior knowledge and processes to construct new knowledge.
- e. Voluntarily use a variety of resources to investigate topics of interest.

2. **Develop social skills and ethical responsibility.**

- a. Respect similarities and differences in others.
- b. Treat others with kindness and fairness.
- c. Follow classroom and school rules.
- d. Include others in learning and play activities.
- e. Participate with others when making decisions and solving problems.
- f. Function positively as a member of a family, class, school, and community.



3. Demonstrate responsible emotional and cognitive behaviors.

- a. Recognize own values, talents, and skills.
- b. Express self in positive ways.
- c. Demonstrate aesthetic awareness.
- d. Demonstrate appropriate behavior.
- e. Express feelings appropriately.
- f. Meet and respect needs of self and others.

4. Develop physical skills and personal hygiene.

- a. Respect physical similarities and differences in self and others.
- b. Learn proper care of the body for health and fitness.
- c. Develop knowledge that enhances participation in physical activities.
- d. Display persistence in learning motor skills and developing fitness.
- e. Use physical activity for self-expression.

5. Understand and use basic concepts and skills.

- a. Develop phonological and phonemic awareness.
- b. Decode, read, and comprehend written text and symbols.
- c. Develop vocabulary.
- d. Develop reasoning and sequencing skills.
- e. Demonstrate problem-solving skills.
- f. Observe, sort, and classify objects.
- g. Make and interpret representations, graphs, and models.
- h. Recognize how content ideas interconnect.
- i. Make connections from content areas to application in real life.

6. Communicate clearly in oral, artistic, written, and nonverbal form.

- a. Share ideas using communication skills.
- b. Predict an event or outcome based on evidence.
- c. Use appropriate language to describe events, objects, people, ideas, and emotions.
- d. Listen attentively and respond to communication.

Kindergarten Language Arts Core Curriculum

Standard I:
Oral Language—
Students develop
language for
the purpose
of effectively
communicating
through listening,
speaking, viewing,
and presenting.

Standard I: Oral Language—Students develop language for the purpose of effectively communicating through listening, speaking, viewing, and presenting.

Objective 1: Develop language through listening and speaking.

- a. Listen attentively.
- b. Listen and demonstrate understanding by responding appropriately (e.g., follow two-step directions).
- c. Speak clearly and audibly with expression in communicating ideas.
- d. Speak in complete sentences.

Objective 2: Develop language through viewing media and presenting.

- a. View a variety of media presentations attentively.
- b. Use a variety of formats (e.g., show and tell, drama, sharing of books) in presenting with various forms of media.



Standard II: Concepts of Print—Students develop an understanding of how printed language works.

Objective 1: Demonstrate an understanding that print carries “the” message.

- a. Recognize that print carries different messages.
- b. Identify messages in common environmental print (e.g., signs, boxes, wrappers).

Objective 2: Demonstrate knowledge of elements of print within a text.

- a. Identify front/back, top/bottom, left/right of text/book.
- b. Discriminate between upper- and lower-case letters, numbers, and words in text.
- c. Show the sequence of print by pointing left to right with return sweep.
- d. Identify where text begins and ends on a page.
- e. Identify punctuation in text (i.e., periods, question marks, exclamation points).

Standard II:
Concepts of Print—
Students develop
an understanding of
how printed language
works.

Standard III:
Phonological
and Phonemic
Awareness—
Students develop
phonological
and phonemic
awareness.

Standard III: Phonological and Phonemic Awareness—Students develop phonological and phonemic awareness.

Objective 1: Demonstrate phonological awareness.

- a. Count the number of words in a sentence.
- b. Identify and create a series of rhyming words orally (e.g., cat, bat, sat, _____).
- c. Recognize words beginning with the same initial sound in an alliterative phrase or sentence (e.g., Six snakes sold snacks and sodas.).

Objective 2: Recognize like and unlike word parts (oddity tasks).

- a. Identify the word that does not rhyme in a series of words (e.g., bat, cat, sat, pig).
- b. Identify the words with same beginning consonant sound in a series of words (e.g., man, sat, sick) and ending consonant sound (e.g., man, sat, then).

Objective 3: Orally blend word parts (blending).

- a. Blend syllables to make words (e.g., /ta/.../ble/, table).
- b. Blend onset and rimes to make words (e.g., /p/.../an/, pan).
- c. Blend individual phonemes to make words (e.g., /s/.../a/.../t/ t/, sat).

Objective 4: Orally segment words into word parts (segmenting).

- a. Segment words into syllables (e.g., table, /ta/.../ble/).
- b. Segment words into onset and rime (e.g., pan, /p/...an).
- c. Segment words into individual phonemes (e.g., sat, /s/.../t/ a/.../t/).

Objective 5: Orally manipulate phonemes in words and syllables (manipulation).

- a. Substitute initial sound (e.g., replace the first sound in mat to /s/, say sat).
- b. Substitute initial sound to create new words (e.g., replace the first sound in mat with letters of the alphabet).

Standard IV: Phonics and Spelling—Students use phonics and other strategies to decode and spell unfamiliar words while reading and writing.

Objective 1: Demonstrate an understanding of the relationship between letters and sounds.

- a. Name all upper-and lower-case letters of the alphabet in random order.
- b. Match consonant and short vowel sounds to the correct letter.
- c. Blend simple cvc sounds into one-syllable words.

Objective 2: Use knowledge of structural analysis to decode words.

- a. Identify and read grade level contractions and compound words.
- b. Identify sound patterns and apply knowledge to decode words (e.g., blends, digraphs, vowel patterns, r-controlled vowels).
- c. Demonstrate an understanding of representing the same sound with different patterns by decoding these patterns accurately in isolation and in text (e.g., ee, ea, ei, e).
- d. Use knowledge of root words and prefixes (e.g., re, un, mis) and suffixes (e.g., s, es, ed, ing, est, ly) to decode words.
- e. Use letter and syllable patterns to pronounce multisyllabic words.

Objective 3: Spell words correctly.

- a. Hear and write letters to represent single sounds in words.
- b. Spell a small number of grade level words (e.g., you, the, to, is).
- c. Spell first name correctly.

Objective 4: Use spelling strategies to achieve accuracy (e.g., prediction, visualization, association).

- a. Use knowledge about spelling to predict the spelling of new words.
- b. Associate the spelling of new words with that of known words.

**Standard IV:
Phonics and
Spelling—Students
use phonics and
other strategies to
decode and spell
unfamiliar words
while reading and
writing.**

Standard V:
Fluency—Students
develop reading
fluency to read
aloud grade level
text effortlessly
without hesitation.

Standard V: Fluency—Students develop reading fluency to read aloud grade level text effortlessly without hesitation.

Objective 1: Read aloud grade level text with appropriate speed and accuracy.

- a. Read alphabet letters in random order with automaticity.
- b. Read numerals from zero to ten in random order with automaticity.

Objective 2: Read aloud grade level text effortlessly with clarity.

- a. Use appropriate intonation and expression during unison oral reading with the teacher.
- b. Read with automaticity approximately 25 high-frequency/sight words.

Standard VI: Vocabulary—Students learn and use grade level vocabulary to increase understanding and read fluently.

Objective 1: Learn new words through listening and reading widely.

- a. Use new vocabulary learned by listening, reading, and discussing a variety of genres.
- b. Learn the meaning of a variety of grade level words (e.g., words from literature, social studies, science, math).
- c. Use resources to learn new words by relating them to known words (e.g., books, charts, word walls).

Objective 2: Use multiple resources to learn new words by relating them to known words and/or concepts. See second, third, fourth, fifth, and sixth grades.

Objective 3: Use structural analysis and context clues to determine meanings of words.

- a. Identify meanings of words by looking at the root word and using known endings (e.g., car, cars; jump, jumped, jumping).
- b. Monitor reading using context to explain the meanings of unknown key words from text read aloud.

**Standard VI:
Vocabulary—
Students learn
and use grade
level vocabulary
to increase
understanding and
read fluently.**

Standard VII:
Comprehension—
Students
understand,
interpret, and
analyze narrative
and informational
grade level text.

Standard VII: Comprehension—Students understand, interpret, and analyze narrative and informational grade level text.

Objective 1: Identify purposes of text.

- a. Discuss purpose for reading.
- b. Discuss author's purpose.

Objective 2: Apply strategies to comprehend text.

- a. Relate prior knowledge to make connections to text (e.g., text to text, text to self, text to world).
- b. Ask questions about text.
- c. Make predictions using picture clues, title, and prior knowledge.
- d. Make inferences and draw conclusions from text.
- e. Retell identifying key ideas.
- f. Compile information from text.

Objective 3: Recognize and use features of narrative and informational text.

- a. Identify beginning, middle, and ending of text.
- b. View a variety of simple genres: nursery rhymes, fairy tales, poems, realistic fiction, fantasy.
- c. Identify information from pictures.
- d. Recognize information as real/make believe.
- e. View a variety of informational texts (e.g., pictures, books).

Standard VIII: Writing—Students write daily to communicate effectively for a variety of purposes and audiences.

Objective 1: Prepare to write by gathering and organizing information and ideas (pre-writing).

- a. Generate ideas for writing by listening, talking, drawing, looking at literature and informational text, being read to, and reflecting on personal experiences.
- b. Select topics from generated ideas.

Objective 2: Compose a written draft.

- a. Draft ideas on paper, utilizing pictures with labels/words.
- b. Select appropriate words to convey meaning.

Objective 3: Revise by elaborating and clarifying a written draft.
See first, second, third, fourth, fifth, and sixth grades.

Objective 4: Edit written draft for conventions.

- a. Edit writing of first name for appropriate capital and lower-case letters.
- b. Edit writing for the spelling of a key word.

Objective 5: Use fluent and legible handwriting to communicate.

- a. Print all upper- and lower-case letters of the alphabet and numerals 0-9 using proper form, proportions, and spacing.
- b. Write with increasing fluency in forming manuscript letters and numerals.
- c. Write name legibly using correct manuscript form.

Objective 6: Write in different forms and genres.

- a. Produce personal writing (e.g., All About Me books, notes).
- b. Produce traditional and imaginative stories, narrative and formula poetry as a shared writing activity.
- c. Produce functional text (e.g., ABC books, labels, signs).
- d. Share illustrations and writing with others.
- e. Take part in producing group products.

Standard VIII:
Writing—Students write daily to communicate effectively for a variety of purposes and audiences.

Kindergarten Mathematics Core Curriculum

Standard I:

Students will understand simple number concepts and relationships.

By the end of kindergarten, students understand small numbers, quantities, and simple shapes in their everyday environment. They count, compare, describe and sort objects, and develop a sense of patterns. Students also develop an understanding of measurable attributes of objects.

Standard I: Students will understand simple number concepts and relationships.

Objective 1: Identify and use whole numbers up to 30.

- Represent whole numbers using concrete, pictorial, and symbolic representations.
- Order a set of up to ten objects and use ordinal numbers from first to tenth to identify the position of the object in the chosen order.
- Use one-to-one correspondence when counting a set of objects and develop a strategy for keeping track of counted and uncounted objects.

Objective 2: Identify and use simple relationships among whole numbers up to 30.

- Estimate quantities in a set of objects using multiples of 10 as benchmark numbers.
- Compose and decompose quantities to establish a relationship between the parts and the whole.
- Recognize 5 or 10 as a part of the part-whole relationship of numbers.
- Compare sets of objects and determine whether they have the same, fewer, or more objects.

Objective 3: Model, describe, and illustrate meanings of addition and subtraction for whole numbers less than ten.

- Demonstrate the joining and separating of sets of objects to solve problems.
- Describe the joining or separating of sets with informal language when using models.
- Record pictorially the results from joining or separating of sets.

Mathematical language and symbols students should use:

add, subtract, first, second, third, fourth, fifth, sixth, seventh, eighth, ninth, tenth, same, fewer, more

Exploratory Concepts and Skills

- Count by ones, beginning from any number in the counting sequence.
- Represent quantities using concrete objects and investigate partitioning of sets.
- Create problems that can be solved using addition and subtraction.

Standard II: Students will sort and classify objects as well as recognize and create simple patterns.

Objective 1: Identify, sort, and classify objects according to common attributes.

- a. Sort objects into groups by attribute and identify which attribute was used.
- b. Describe multiple ways to sort and classify a group of objects.

Objective 2: Identify, duplicate, describe, and extend simple repeating and growing patterns.

- a. Identify and describe simple repeating patterns with numbers and shapes.
- b. Duplicate and extend simple repeating patterns with numbers and shapes.
- c. Describe simple growing patterns with shapes.
- d. Identify simple patterns in the environment.

Mathematical language and symbols students should use:
sort, repeating patterns, growing patterns

Exploratory Concepts and Skills

- Explore skip counting by fives, tens, and twos.

Standard II:

Students will sort and classify objects as well as recognize and create simple patterns.



Standard III:
Students will understand basic geometry and measurement concepts as well as collect and organize data.

Standard III: Students will understand basic geometry and measurement concepts as well as collect and organize data.

Objective 1: Identify and create simple geometric shapes and describe simple spatial relationships.

- a. Identify, name, describe, and draw circles, triangles, rectangles, and squares in various sizes and orientations.
- b. Combine shapes to create two-dimensional objects (e.g., use a triangle and square to create a picture of a house).
- c. Use words to describe position and distance.
- d. Investigate two- and three-dimensional shapes including hexagons, trapezoids, spheres, cubes, and cones.

Objective 2: Identify and use measurable attributes of objects and units of measurement.

- a. Identify clocks and calendars as tools that measure time.
- b. Identify a day, week, and month on a calendar and name the days of the week in order.
- c. Identify pennies, nickels, dimes, and quarters as units of money.
- d. Compare two objects by measurable attributes (i.e., length, weight) and order several objects by measurable attributes (i.e., length, weight).

Objective 3: Collect and organize simple data.

- a. Pose questions and gather data about self and surroundings.
- b. Organize data obtained from sorting and classifying objects.

Mathematical language and symbols students should use:

circle, triangle, rectangle, square, Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, penny, nickel, dime, quarter, shorter, longer, above, below, near, far, between

Exploratory Concepts and Skills

- Measure objects using non-standard units.
- Identify the value of a penny, nickel, dime, and quarter.
- Organize data in lists, tables, and simple graphs.

Kindergarten Fine Arts, Health, Physical Education, Science, and Social Studies Core Curriculum

Standard I: Students will develop a sense of self.

Objective 1: Describe and practice responsible behaviors for health and safety.

- a. Describe proper care of the body (e.g., proper brushing of teeth, eating a variety of foods, proper hand washing, sneezing into sleeve).
- b. Recognize that food is fuel for the body.
- c. Recognize signs of physical activity (e.g., heart rate, breathing, sweat).
- d. Identify helpful and harmful substances to the body.
- e. Recall basic safety (e.g., follow rules, maintain personal space/boundaries, know phone number, address, emergency number).

Objective 2: Develop skills in gross and fine motor movement.

- a. Participate in regular physical activity that requires exertion (e.g., walk, jog, jump rope).
- b. Explore a variety of fundamental and manipulative gross motor skills (e.g., hop, skip, twirl, dance, throw, catch, kick, strike).
- c. Perform a variety of fine motor skills (e.g., draw, cut, paste, mold, write).
- d. Maintain personal space and boundaries while moving.
- e. Create and perform simple dance movements that express who one is, knowledge of the body, feelings, senses, and ideas in time and space.

Objective 3: Develop and use skills to communicate ideas, information, and feelings.

- a. Identify and express ideas, information, and feelings in a variety of ways (e.g., draw, paint, tell stories, play, make believe, dance, sing).
- b. Recognize similar colors as being members of the family of reds, blues, and yellows and shapes as being similar to squares, circles, and triangles.

Standard I:
Students will
develop a sense
of self.

- c. Describe sounds in terms of dynamics (loud/soft), pitch (high/low), duration (long/short; fast/slow), and timbre (tone of an animal, human, musical instrument, or machine).
- d. Develop competency in beat accuracy and respond to an understanding of beat as a life force through moving, singing, chanting, or playing instruments.
- e. Express emotions by selecting and playing a variety of simple rhythm instruments.

Standard II: Students will develop a sense of self in relation to families and community.

Objective 1: Describe factors that influence relationships with family and friends.

- a. Identify ways individuals are alike and different.
- b. Identify contributions of family members.
- c. Describe how children change over time.
- d. Identify behaviors to initiate play and develop friendships.
- e. Demonstrate positive interactions with peers and adults.

Objective 2: Identify important aspects of community and culture that strengthen relationships.

- a. Recognize and follow family and classroom rules.
- b. Describe the school community (e.g., students, teachers, secretary, custodian, principal).
- c. Describe resources in the community (e.g., police officer, firefighter, library, museum).
- d. Describe cultural traditions in family and community.
- e. Recognize national symbols and recite the Pledge of Allegiance.

Objective 3: Express relationships in a variety of ways.

- a. Recognize traditions, music, dances, artwork, poems, rhymes, and stories that distinguish cultures.
- b. Develop skills in storytelling through moving the body and making sounds while pretending to be characters in a familiar story.
- c. Create and perform/exhibit dances, visual art, music, and dramatic stories from various cultures.

Standard II:
Students will develop a sense of self in relation to families and community.

Standard III:
Students will
develop an
understanding
of their
environment.

Standard III: Students will develop an understanding of their environment.

Objective 1: Investigate changes in the seasons.

- a. Identify the seasons and represent each with pictures and songs.
- b. Observe and describe typical weather for each of the seasons.
- c. Describe the information each of the five senses provides with the changing of seasons.
- d. Observe and describe changes in behavior of animals as the seasons change.
- e. Describe how people change their behavior as the seasons change.

Objective 2: Observe and describe animals in the local environment.

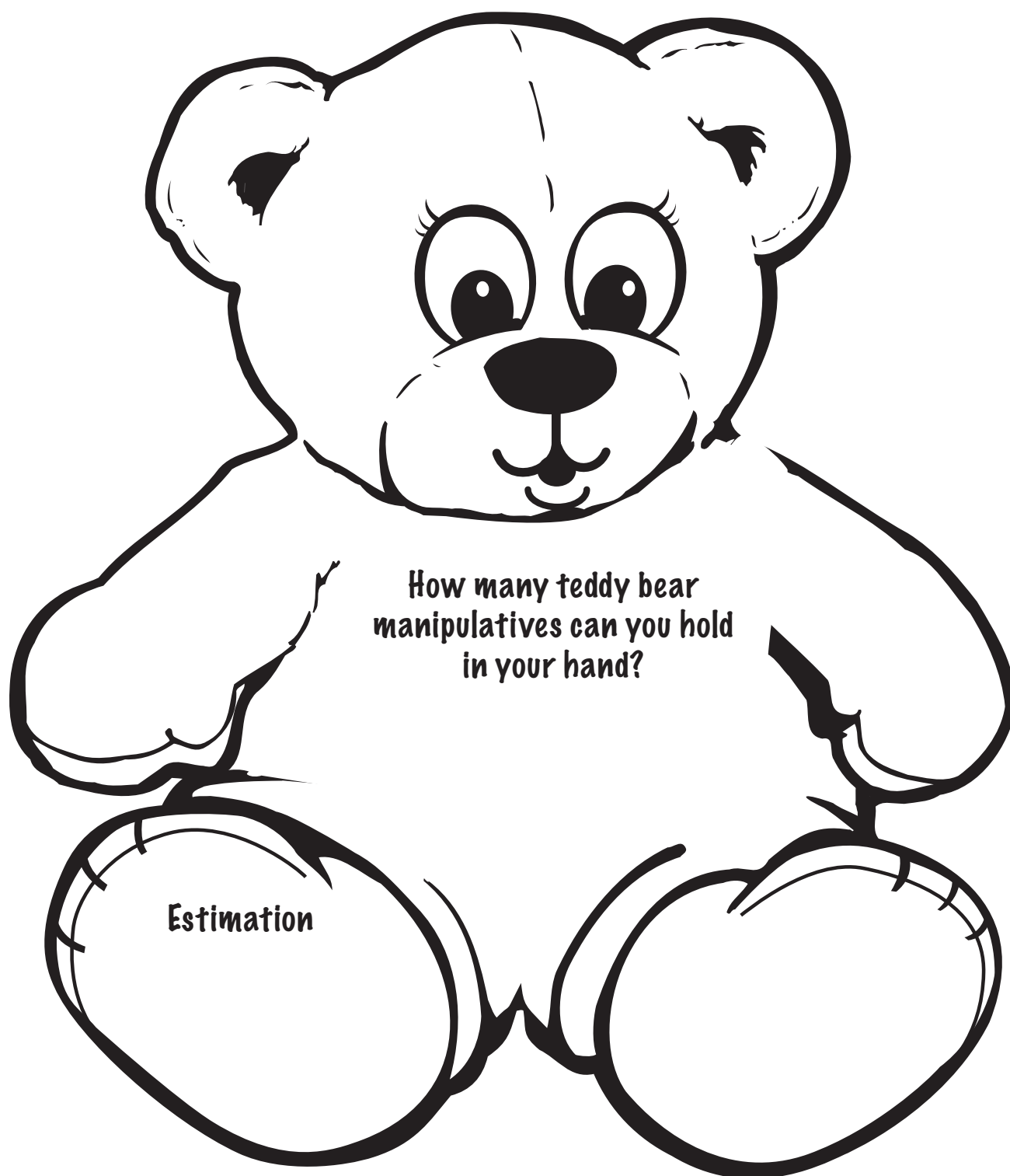
- a. Observe, describe, draw, and compare familiar animals.
- b. Describe how young animals are different from adult animals.
- c. Describe how animals care for their young.
- d. Observe and imitate the sounds and movements of animals with songs, dances, and storytelling.
- e. Distinguish between real and make-believe animal behaviors.

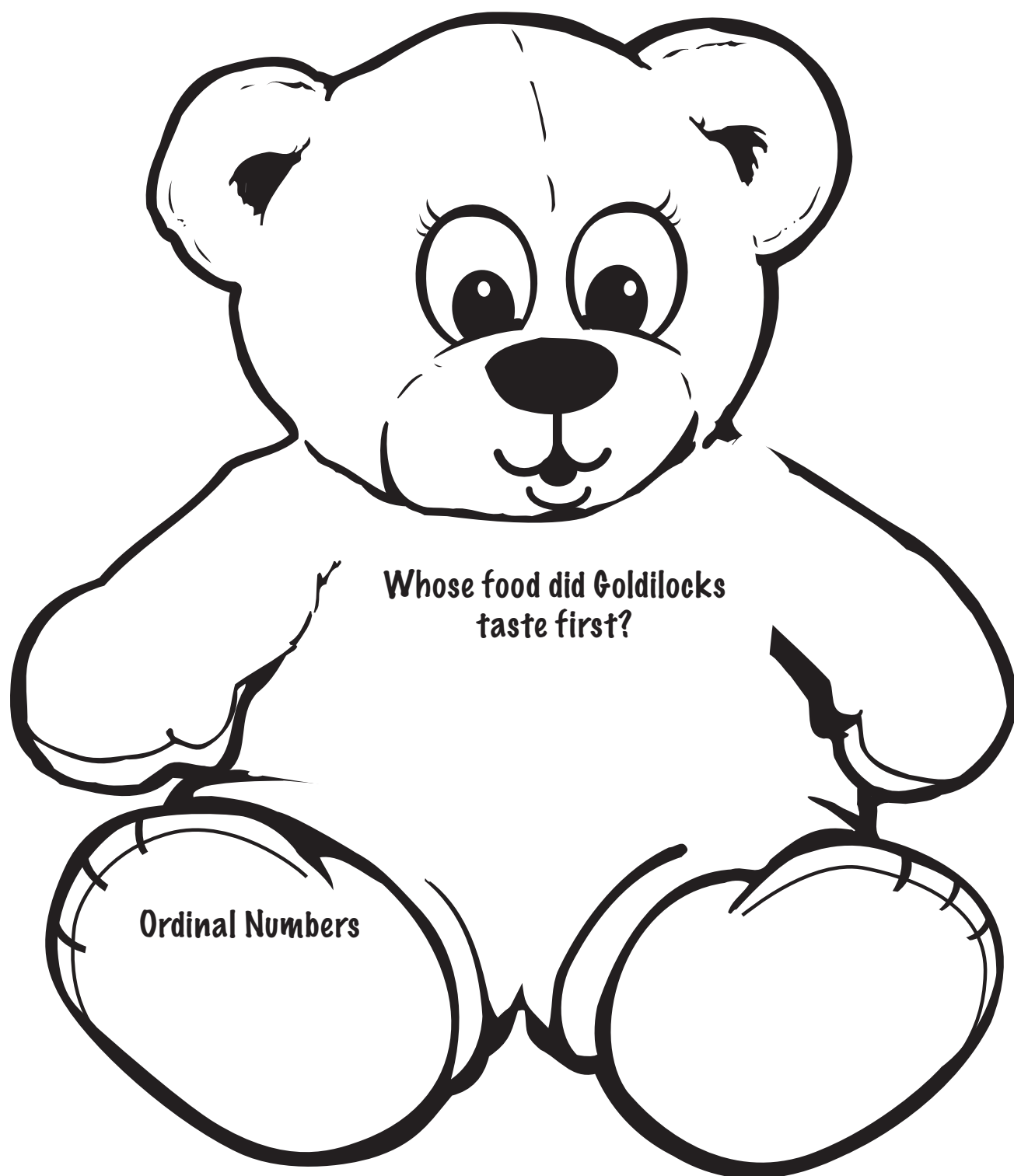
Objective 3: Recognize symbols and models used to represent features of the environment.

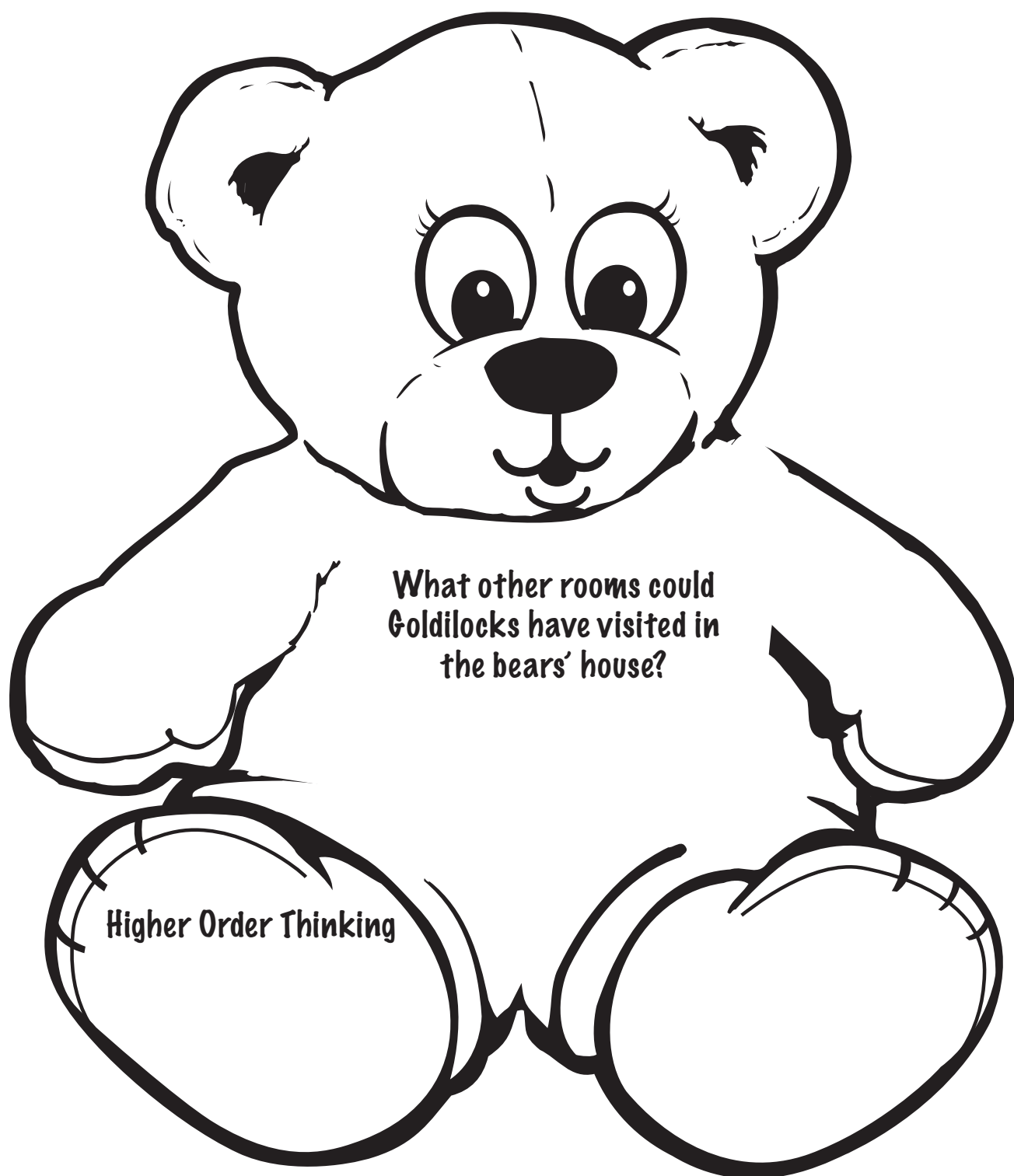
- a. Recognize that maps and globes are symbols for actual places.
- b. Identify items on a map of the classroom.
- c. Explore basic map and globe directions and characteristics (e.g., top, bottom, right, left, land, water, Arctic Ocean, Antarctica).
- d. Make representations of things observed in the environment (e.g., drawing, painting, building structures with blocks, making models with clay).

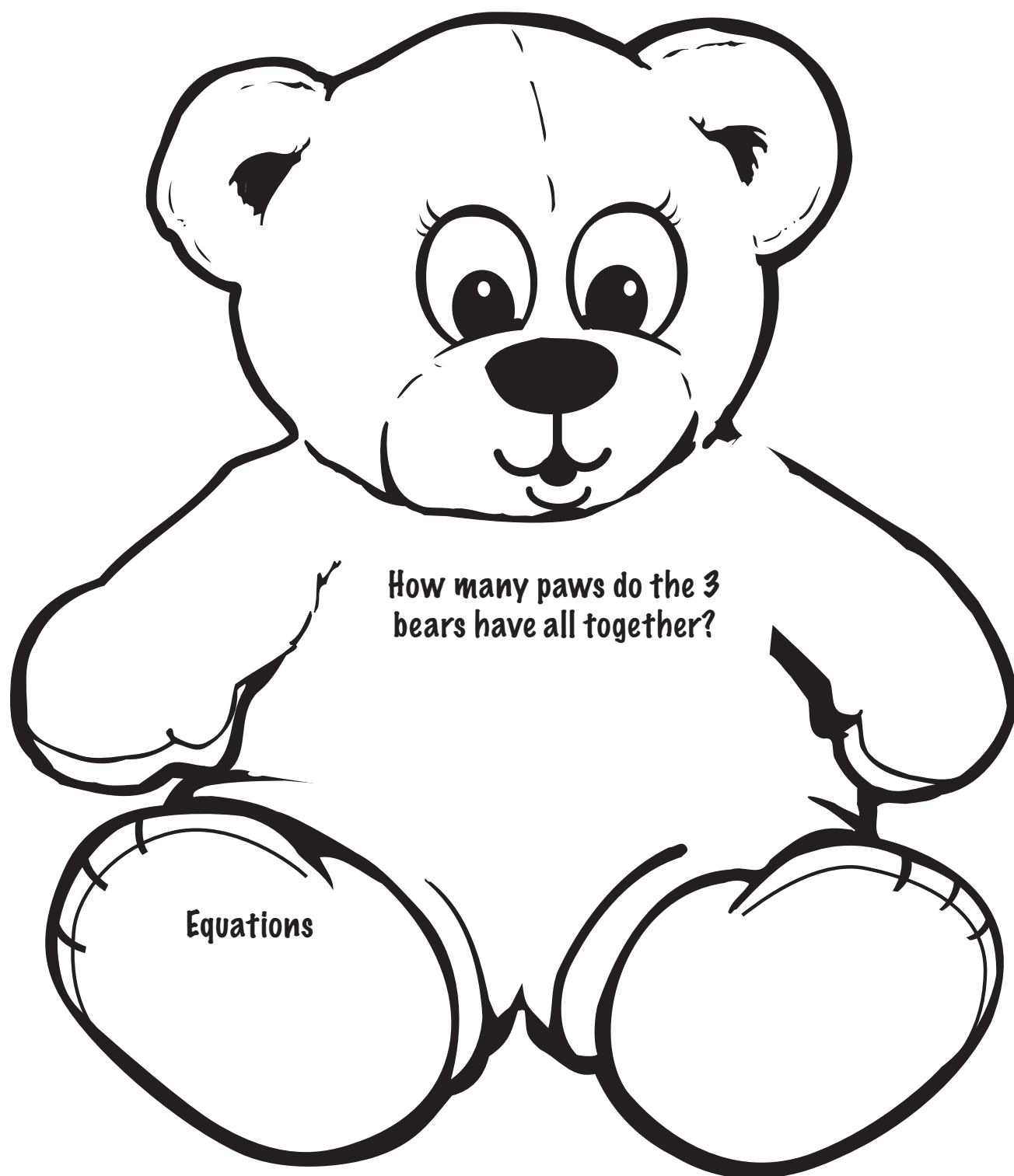
Facilitated Activities

Teddy Bear Manipulatives









Journal Prompts

What things did you like to do with your mother?

What things did your dad like to do in his spare time?

Tell about your wedding day.

Do you like rainstorms? Why or why not?

How do you feel about water? Playing in it? Seeing it?

Do you have a favorite author? Who, why, and tell about favorite books as a child, youth, adult.

Tell about pets you had as a child, youth, adult.

What do you think brings good luck?

What is your personal secret to happiness?

Where were you on 9-11?

Tell about family traditions-Christmas, birthdays, Easter, etc.

What would you like to be remembered for?

What is your greatest joy? Sorrow?

Explain a goal that you have now.

Tell about conditions surrounding your birth that you are aware of. How did you get your name?

Did you have a favorite toy as a child? Did it have a name? What memories are connected with it?

Describe your yard as a child.

What makes each of your brothers and sisters special? Be specific.

Describe a childhood birthday party.

Think back... was there a teacher or a class that had a great influence on you?

What games did you play in your house or neighborhood?

How did you like being the oldest, middle or youngest child?

Tell about where and when you learned to drive.

Tell about an interesting date that you went on.

What jobs did you have in high school and/or college?

What things are you most grateful for? List 5 and why.

Name _____

Learning Activity Paper #1



Learning Activity Paper #2

[illegible]

Name _____

Learning Activity Paper #3

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30



Math I-1 & 2

Activities

Number Sense

Who's On First?

Standard I:

Students will understand simple number concepts and relationships.

Objective 1:

Identify and use whole numbers up to 30.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:

Language Arts VI-1; Vocabulary
 Language Arts VII-2; Strategies to comprehend text
 Language Arts VII-3; Recognize features of text
 Language Arts VIII-5; Use fluent and legible numeral writing

Math
Standard
I

Objective
1

Connections

Background Information

Integrating curriculum is easy when it comes to math and literature. There are so many wonderful books available that can not only enlighten students in literacy but strengthen math skills as well. Using literature is one of the easiest ways to teach students the use of ordinal numbers. We are constantly asking our students, “What happened first in the story?”

As Marilyn Burns, the creator and founder of Math Solutions Professional Development says, “Evidence shows that teaching math through children’s books motivates children to learn math in exciting new ways, encourages students to think and reason mathematically and builds students’ appreciation for math and literature.”

Many literature books today are written with an emphasis on mathematics. Teachers need to build a library of literature books with a mathematical connection. Using literature is a way to engage students in learning mathematics. It helps students understand that mathematics is connected to the real world and can solve real world problems.

Research Basis

Sutton, J. & Krueger, A. (Eds.). (2002). *ED Thoughts: What We Know about Mathematics Teaching and Learning*. Aurora, Co: *Mid-continent Research for Education and Learning*, p. 54.

In real life, learning experiences are not separated into academic disciplines or subject areas. A student’s classroom experiences should

mirror this. Interconnections among the disciplines, when emphasized at all grade levels, will support learning by making the mathematics curriculum more meaningful.

Burns, M. (2005). Lessons by Marilyn Burns Using Storybooks to Teach Math. *Instructor Magazine*. 27-30.

For many of us, the storybook shelf isn't the first place we go to when we start to plan a math lesson. But children's books can be a great math-teaching tool. They spark students' imaginations in ways that exercises in textbooks or workbooks often don't. When I visit classrooms, I find that connecting math to literature can boost the confidence of those who love books but are "Math-wary." And students who love the abstraction of math can learn to appreciate stories in a whole new way.

Caskey, M. (2001). A Lingering Question for Middle School: What is the Fate of Integrated Curriculum? *Childhood Education*, Vol.78.

A truly integrated curriculum enables teachers and their students to make connections between their school learning experiences and real life, while the separate subject approach leaves students with a disconnected view of knowledge that fails to reflect the way that real people attack problems in the real world.

Invitation to Learn

Materials

- ☐ Fishing net
- ☐ Fishing line

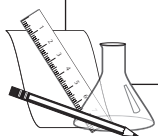


Use a fishing net and spread it out on the floor. Then go fishing for students. Pretend to throw out your fishing line and catch a student by name. Reel them in! Have the students stand in a row, on the net, in the order that they were caught. Ask questions: Who was the first fish to be caught? Who was the third fish to be caught? Continue asking questions. Upon completion of the questions, pretend to throw the fish back into the water. The game can continue by having a new angler.

Instructional Procedures

Materials

- ☐ Ordinal Numbers Cards



Stand in Line

1. Choose several students to stand in a line in front of the class.
2. Have the class count how many students are in the line.
3. Ask: Who's first? Second? Third?
4. Now, have the students turn the other direction so that the person that was last is now the leader.
5. Ask: Now, who's first? Second? Third?

6. Discuss how their places are different and why.
7. Students could also hold up cards with 1st, 2nd, 3rd, 4th, 5th, 6th, 7th, 8th, 9th, and 10th.

This activity can be done anytime that the class is lined up. Use this activity all year to help reinforce ordinal counting.

Seven Blind Mice

Day One:

1. Read the book *Seven Blind Mice*, by Ed Young.
2. Integrate prediction strategies before reading the story (e.g., what will this story be about?).
3. As the story is read, point out the order in which the colored mice appear.
4. Once the story is read, have the students recall the different colors of the mice.
5. Post the colored mice (that you have colored from the *Seven Blind Mice Pattern*) as the students recall the colors.
6. Ask the students which colored mouse came first, second, third, fourth, fifth, sixth, and seventh. Move the mice into the correct order in which they appear in the story.

This is a great introduction to ordinal numbers.

Day Two:

Read the story again. Put the mice in order and write the ordinal numbers next to the colored mice (1st, 2nd, 3rd, 4th, 5th, 6th, and 7th).

Day Three:

1. Read the story again. Ask the students which days of the week each mouse appeared in the story.
2. Write the days of the week next to each mouse.

Day Four:

1. Pass out a copy of the *Seven Blind Mice Pattern* and have the students color each mouse according to the colors in the book and then cut out each mouse. Students can write the correct ordinal number or number on the back of the mice.
2. Pass out a copy of the *Elephant Pattern*. Have students color the elephant and then cut it out.
3. Use a large envelope to store the cutouts.

Materials

- ☐ *Seven Blind Mice*
- ☐ *Seven Blind Mice Pattern*
- ☐ *Elephant Pattern*
- ☐ Colored Pencils or Crayons
- ☐ Envelope



Materials

- ☐ *Where's Harley?*
- ☐ *Harley the Rabbit Pattern*
- ☐ *Children Pattern*
- ☐ Apartment Building Floor Mat
- ☐ Index Cards
- ☐ Construction Paper
- ☐ Markers



Day Five:

1. Read the *Seven Blind Mice* story to the class.
 2. Have the students use their mice and elephant to follow the story.
 3. Students then retell the story to a friend using their cutouts.
- Students should be using ordinal numbers when retelling the story.

Where's Harley?

Day One:

1. Read the book *Where's Harley?*, by Carol and Amanda Felton.
2. Use prediction strategies before reading the story.
3. As the story is read, point out the different floors in the apartment building where Harley and the children can be found.

Day Two:

1. Display the apartment building floor mat.
2. Write 1st-10th on the index cards and label the floors of the apartment building.
3. Explain that in an apartment building the number of floors starts at the bottom and goes to the top.
4. What other things can you think of where the numbers start at the bottom and go to the top? Stairs, elevators, escalators, buildings, etc.
5. Identify on the apartment building mat where Harley started in the story and where he was finally found.
6. Have *Harley the Rabbit Pattern* colored, cut out, and laminated. Move Harley from where he started to where he was found.

Day Three:

1. Have the *Children* and *Harley Patterns* colored, cut out, and laminated ready to use.
2. Display the apartment building floor mat.
3. Read the story.
4. Retrace the route that Harley took through the apartment building and post the location of the children as you read the story. This will allow students to see why Harley was so difficult to find.

Day Four:

1. Give each student his/her own copy of the *Children and Harley Patterns*. (Make Smaller)
2. Have students color and cut out the patterns.
3. An apartment building is made out of construction paper and markers. Make sure there are 10 floors in the apartment building.
4. Have the children put their cutouts and apartment building in a large envelope.

Day Five:

1. Have students remove their cutouts and apartment building from the envelope.
2. Read the story *Where's Harley?*
3. Have students move their cutouts to the appropriate place on the apartment building as the story is read.

Assessment Suggestions

- For *Seven Blind Mice*, check to see if students have written the correct ordinal number on the back of each mouse.
- Watch while the stories *Seven Blind Mice* and *Where's Harley?* are recreated by the students. Make sure that each student is putting items in the correct order/place.
- Student watching is the observation and recording of student's interactions during an instructional activity. These observations can be recorded on small sticky notes or an *Observation Sheet*.

Curriculum Extensions/Adaptations/Integration

- Literature books are the perfect extension for ordinal numbers. Students can recall the order of events from any book (e.g., ask the students what happened first, second, third, etc.).
- Everyday events in the classroom can be discussed using ordinal numbers (e.g., the first thing we do when we get to school is?).
- The fishing net, from the invitation to learn, could be used to have students identify attributes or patterns.
- Have a classroom contest and give prizes using the words first place, second place, third place, etc.

- Use stuffed animals and have the students line them up. Ask students which animal is first? Second? Third? Turn the animals around and ask the same questions.
- The calendar is a perfect way to introduce ordinal numbers. Point out to students that when we say the date, we are using ordinal numbers.
- Sequencing activities lend themselves nicely to the use of ordinal numbers.

Family Connections

- Send home the envelope containing the cut out mice and elephant from the *Seven Blind Mice* book and the cutouts from *Where's Harley?* Have the students retell these stories to their parents using the ordinal numbers.
- Check out the book *Where's Harley?* and have the students explain to their parents how Harley moves from floor to floor. Encourage the students to use the ordinal number vocabulary to explain what is happening in the story. The activities at the back of the book could also be done at home.
- Have the students fill out a paper explaining their routines at home using ordinal numbers (e.g., getting up in the morning, after school, and getting ready for bed).
- Send home a monthly calendar and encourage the students to use ordinal numbers when explaining the dates on the calendar.

Additional Resources

Books

10 Little Rubber Ducks, by Eric Carle; ISBN 0-060-74075-2

First, Second, by Daniel Kharms; ISBN 0-374-32339-9

Henry the Fourth, by Stuart J. Murphy; ISBN 0-06-446719-8

On the Stairs, by Julie Hofstrand Larios; ISBN 1-886910-34-0

Seven Blind Mice, by Ed Young; ISBN 0-329-04408-7

The Hat, by Jan Brett; ISBN 0-399-23101-3

The Mitten, by Jan Brett; ISBN 0-590-44015-2

The Twelve Days of Christmas, by Jack Kent; ISBN 0-590-06163-1

The Twelve Days of Kindergarten, by Deborah Lee Rose; ISBN 0-8109-4512-6

The Twelve Days of Summer, by Jan Andrews; ISBN 1-55143-365-6

The Twelve Days of Winter, by Deborah Lee Rose; ISBN 0-439-92932-6

Where's Harley?, by Carol and Amanda Felton; ISBN: 1-57565-132-7

Web sites

<http://www.mathsolutions.com>

<http://coreacademy.usu.edu> (Materials Kindergarten 2008, Materials First Grade 2006)

<http://illuminations.nctm.org> (Math Lesson Plans)

<http://kidscount1234.com>

http://lessonplanz.com/Lesson_Plans/Mathematics/Grades_K-2/index.shtml

<http://mrspohlmeyerskindergarten.com/mathsense.htm>

<http://www.alfy.com> (On-line Math Games)

<http://www.drmaggieallen.net>

<http://www.funbrain.com>

<http://www.kellyskindergarten.com/math/mathactivities>

http://www.kidport.com/GradeK/Math/NumberSense/MathK_Sequence.htm (On-line Math Games)

<http://www.kidport.com/GradeK/Math/NumberSense/MathKNumbers.htm> (On-line Math Games)

<http://www.littlegiraffes.com>

<http://www.mathsolutions.com>

<http://www.theteacherscorner.net/lesson-plans/math/numbersense/index.htm>

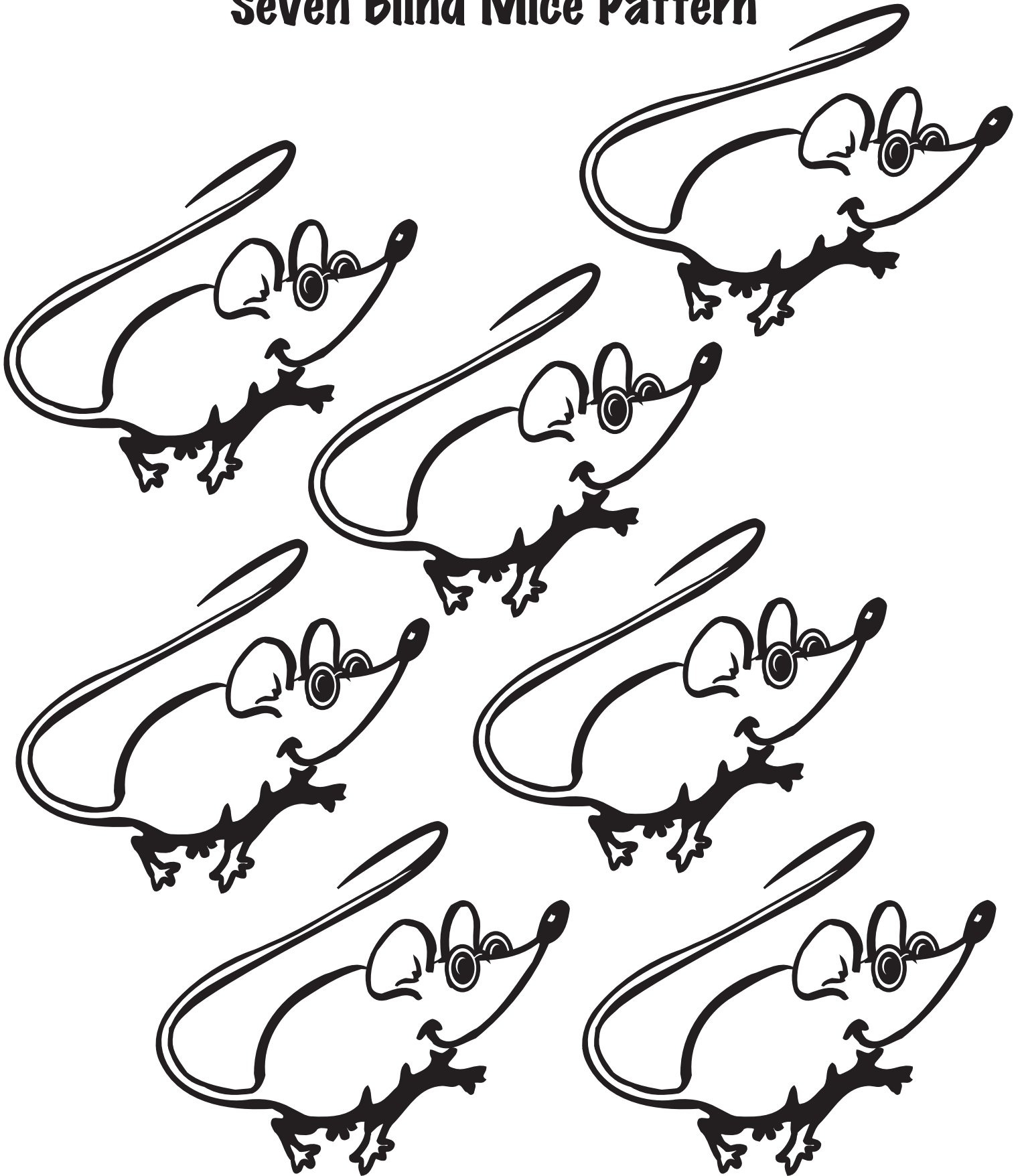
<http://www.toddlerivillage.net>

Organizations

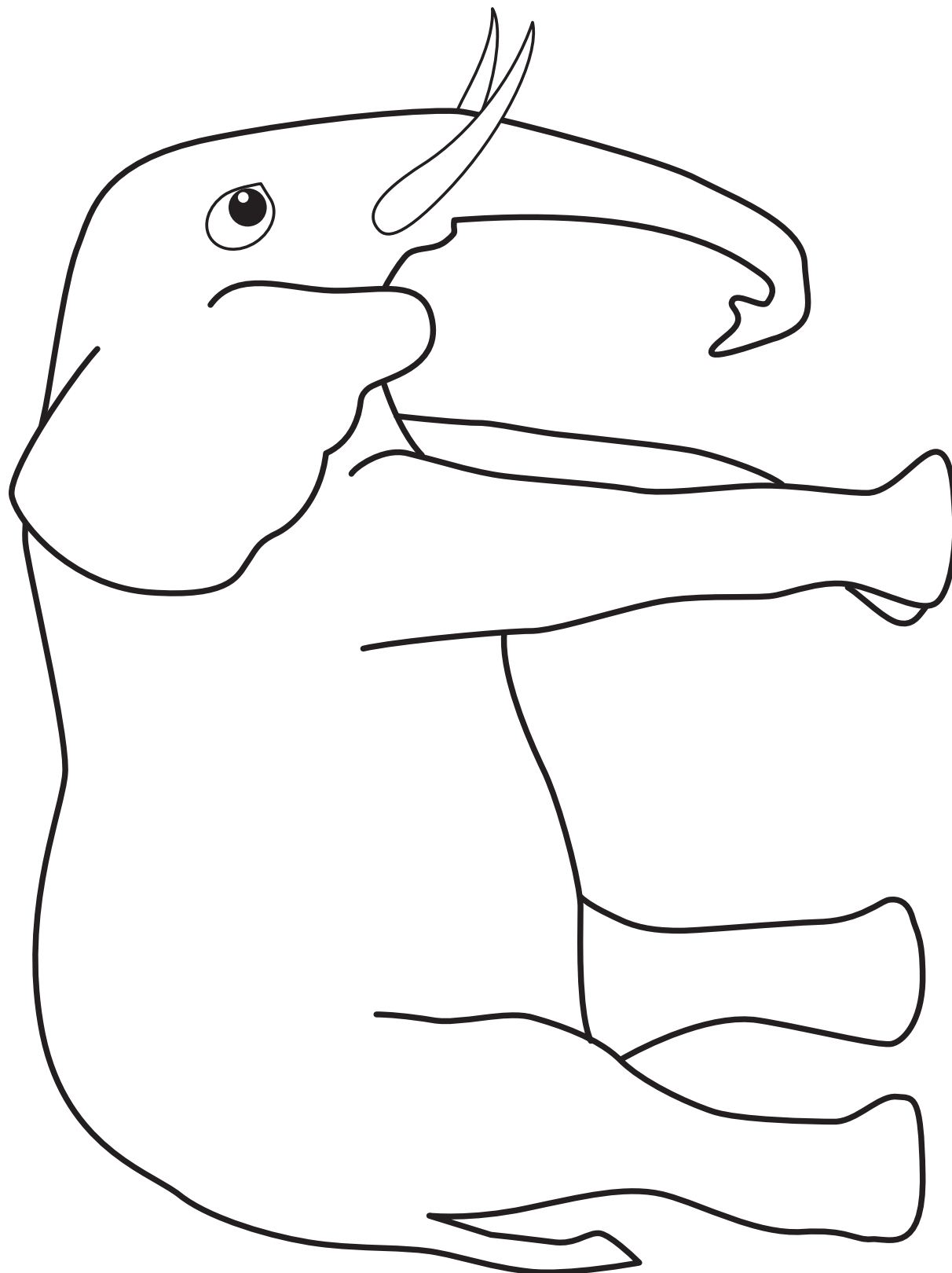
National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502 (703) 620-9840, <http://www.nctm.org>

National Association for the Education Of Young Children, 1509 16th St. N.W., Washington, DC 20036 (202) 232-8777 or (800) 424-2460, <http://naeyc.org>

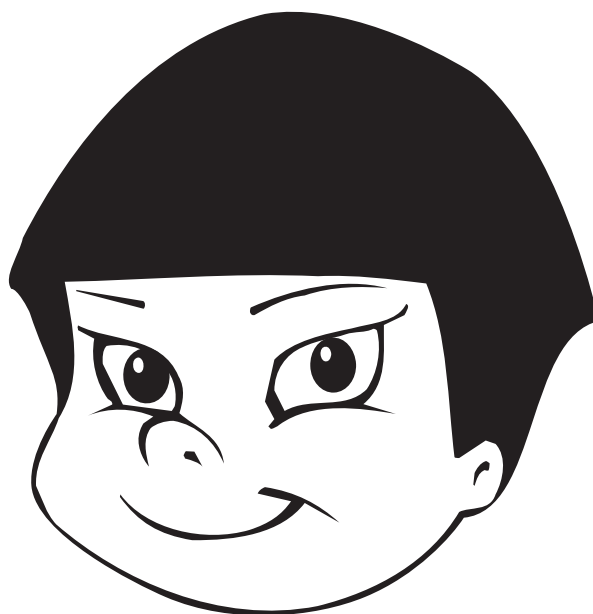
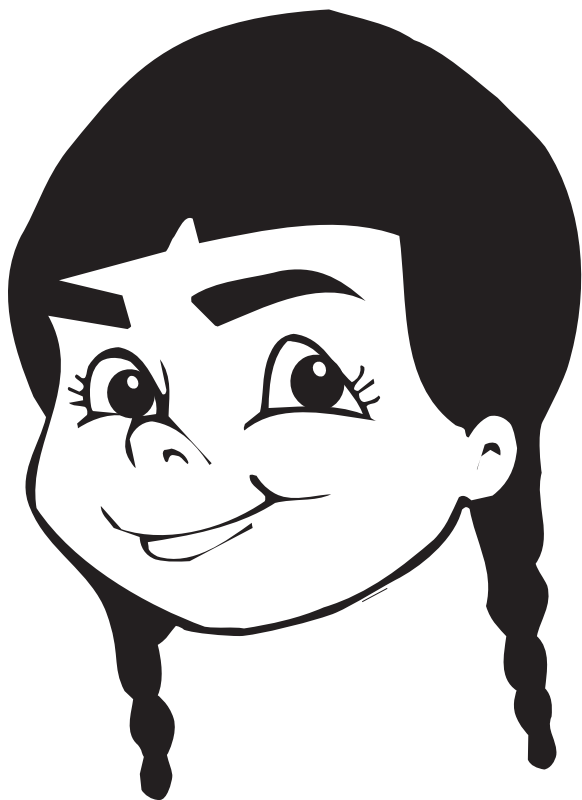
Seven Blind Mice Pattern



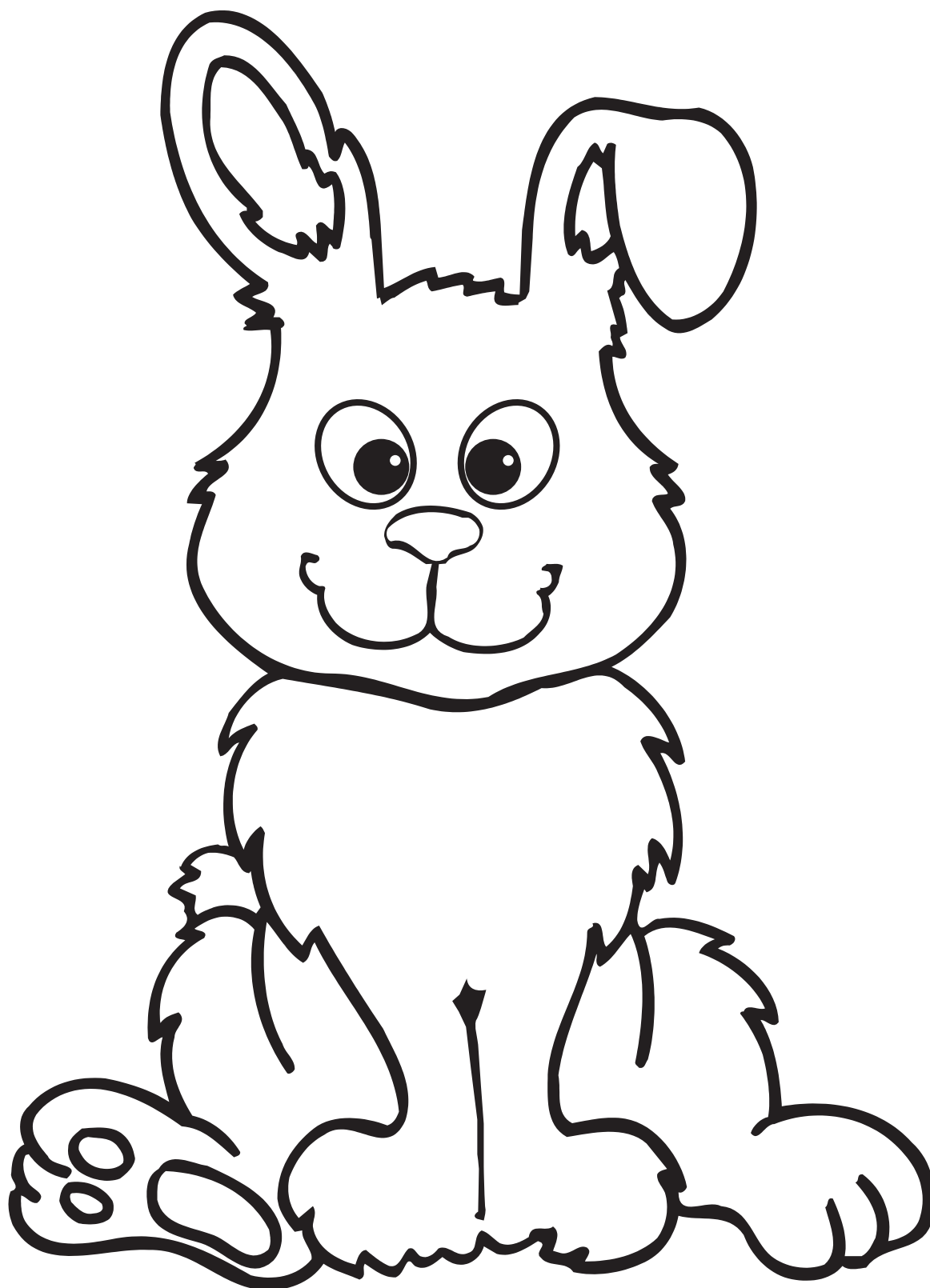
Elephant Pattern



Children Pattern



Harley the Rabbit Pattern



Observation Sheet

Name	Comments
1	
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More, Fewer, Same

Standard I:

Students will understand simple number concepts and relationships.

Objective 2:

Identify and use simple relationships among whole numbers up to 30.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:

Math III-2; Units of measurement

Math
Standard
I

Objective
2

Connections

Background Information

Students that are successful in math have learned to link numbers to quantities. This is the first and most significant step in being a successful mathematician. Many students have an easy time counting but a difficult time when asked to put a number to that which was counted. They may also have a difficult time when the questions, “Which is fewer, 2 or 4?” or “Which is more, 2 or 4?” are asked. It is essential that students have opportunities to explore number combinations and that they are asked these important questions.

The vocabulary of more, fewer, and the same is an integral concept at the early stages of mathematical learning. At the beginning of the school year, most students understand the concept of more. Do not assume because they know which set has more that in turn they know which set has fewer. The vocabulary terms more, fewer and same have to be taught. The vocabulary of math is going to impact how students express their mathematical thinking and future math success. Quantity discrimination is extremely important because it is a key component in estimation and number representation.

Students will be entering your classroom this fall with a variety of informal or formal instruction on number concepts that they bring from home and pre-school. There is going to be a need to differentiate your instruction in number sense.

Research Basis

Burns, M. & Silbey R. (April 2001). Math Journals Boost Real Learning. *Instructor Magazine*. p.18-20.

A math journal is one of the best ways to introduce writing into your math class. It helps students stretch their thinking and

make sense of problems that can sometimes leave them confused or frustrated. When children write in journals, they examine, express, and keep track of their reasoning, which is especially useful when ideas are too complex to keep in their heads. By reading their journals, you can evaluate their progress and recognize their strengths and needs. The math journal thus becomes a great learning tool for your students- and you.

Ediger, M. (2006). Writing in the Mathematics Curriculum. *Journal of Instructional Psychology*. Vol. 33.

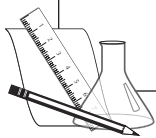
Criteria for Use in Mathematics Writing:

1. Learning needs to be meaningful. Students need to make sense out of what is being learned.
2. Interest is a powerful factor in learning. Mathematics teachers need to provide for the interests of the learner. A hands-on approach should also be stressed to add interest.
3. Students should perceive a purpose in the writing experience. Writing should not be done for the sake of doing so, but rather to achieve a definite goal.
4. Students should work individually as well as collectively in ongoing learning experiences.

Invitation to Learn

Materials

- ☐ Deck of Cards
- ☐ Alligator Puppet



Use a large deck of playing cards (remove the face cards) or multiple cards numbered from 1-10. Play the card game Who Has More? There are two teams/players in this game. Shuffle the deck of cards and place the stack of cards face down on a table. Each team turns over one card at a time and says the number on their card. The team with the highest card keeps both cards. If the cards have the SAME number, the cards are put aside. The teams/players each turn over another card until someone has the highest number. The winner takes all the cards. When the cards have all been used from the stack, the game ends. The teams/players then put their stack of card next to each other and estimate who is the winner. The winner of the game is the team/player with the most cards. An alligator puppet could be used to eat the card that has more. Point out how the alligator puppet has his mouth open looking for more to eat.

Instructional Procedures

Group Activity

1. Introduce the words more, same, and less. Talk about how the words less and fewer mean the same thing and that you will be using both of these math words.
2. Have the students look at the book cover and predict which group of flowers has more and which group has less.
3. Read the book *More or Less* to the class and have them predict the correct answers to the questions that are asked.
4. Go back through the book and have your students come up with their own more/less/same questions.
5. This book can be used over and over again. The photographs lend themselves to further exploration.

Materials

- ☐ *More or Less?*



Center 1: Alligator More/Fewer

Part One:

1. Each student will need a copy of the *Alligator More and Fewer* recording sheet and two number cubes.
2. Explain that the alligator wants to eat the number that is more.
3. The student rolls the two numbered cubes.
4. The number that is more is written on the left side of the paper so that it visually looks like the alligator is going to eat it up!
5. The number that is less is written on the right side.
6. If the student rolls two numbers that are the same, he/she needs to roll again. The alligator cannot eat numbers that are the same.
7. The alligator's mouth looks like the symbol for more. Use this great introduction to teach students the symbols of greater than, less than, or equal.


Materials

- ☐ *Alligator More and Fewer*
- ☐ Number cubes
- ☐ Pencil



Part Two:

1. A student rolls two number cubes and then arranges them to make the largest number and the smallest number (e.g., the roll 3 and 6 should be arranged as 63 for the largest number and 36 for the smallest number).
2. Students record this on the *Alligator More and Fewer* recording sheet. The number that is more should be written on the line so that it visually looks as if the alligator is going to eat it up!




Materials

- ☐ *More/Fewer/Same*
- ☐ Pencil
- ☐ Counters
- ☐ Cup

3. The number that is the least should be written on the line behind the alligator's mouth.
4. If the student rolls two numbers that are the same, he/she needs to roll again. The alligator cannot eat numbers that are the same.

Center 2: Counter Toss

1. Students take a specific number of two-sided counters (e.g., 10, 20, 30 counters)
2. Put the counters in a cup.
3. Shake the cup and the counters
4. Dump the counters onto the table.
5. Sort the counters by color.
6. Record the toss on the *More/ Fewer/ Same* recording sheet.
7. Math Journal: This activity could be recorded in a journal and have the student draw the alligator on their paper.




Materials

- ☐ *More/Fewer/Same Spinner*
- ☐ Interlocking cubes

Center 3: More/Fewer/Same Spinner Game

1. This is a partner game that can be done in a center or as a group.
2. Each partner begins the game with ten interlocking cubes.
3. The first student spins the spinner that is marked More/Fewer/ Same.
4. If the spinner lands on more, the player takes one interlocking cube from his/her partner.
5. If the spinner lands on fewer, he/she has to give one interlocking cube to his/her partner.
6. If the spinner lands on same, they just stay the same.
7. The winner is decided when one player has all of the interlocking cubes.



Materials

- ☐ Three Hoops
- ☐ Manipulatives
- ☐ Index Cards
- ☐ Math journal
- ☐ Pencil

Center 4: Hoop Fun

Part One:

1. Students take a small handful of two different manipulatives.
2. Put the manipulatives in two piles.
3. Count the number of manipulatives in each pile.
4. Use the sorting hoops on the floor.
5. Label index cards with the words More, Fewer, and Same.

6. Place the labeled index card above the sorting hoops.
7. Place the manipulatives inside the appropriate hoop. The manipulatives that have more go into the hoop labeled more. The manipulatives that have less go into the hoop labeled less. If the manipulative groups are the same, place all of them in the hoop labeled same.
8. Journal Activity- This activity could be recorded in a math journal. Students will need to draw three circles in their journals. Have the students label the three circles with More/Fewer/Same. Have students draw a picture to represent the manipulatives in each circle.

Part Two:

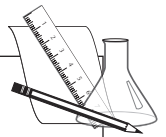
1. Follow the same procedure but use only two circles.
2. Cross the circles to create a Venn diagram.
3. Journal Activity- Have the students draw a Venn diagram in their math journals. Have the students label the Venn diagram *More/Same/Fewer*. Have students draw a picture to represent the manipulatives in each space of the diagram.

Center 5: Tower Power

1. This game may be played as partners.
2. Each player rolls a number cube.
3. Players build their towers, using the interlocking cubes, according to the number that they rolled.
4. With the towers built, have one player spin the More/Fewer/Same Spinner.
5. If the spinner lands on more, the student who has the most blocks takes all of the towers.
6. If the spinner lands on fewer, the student with the fewest blocks takes all of the towers.
7. If the spinner lands on same, the students do not exchange blocks.
8. The winner of each round will set aside the towers that they won.
9. The process is repeated with each player rolling the number cube and building a new tower.
10. Players take turns spinning the spinner.
11. The game ends when there are no more blocks to make towers.

Materials

- ☐ Number Cubes
- ☐ Interlocking Cubes
- ☐ More/Fewer/Same Spinner
- ☐ Pencil



Materials

- ☐ Simple Balance
- ☐ Manipulatives
- ☐ *More/Fewer/Same*
- ☐ Pencils



12. Students could use a chart and keep track of wins by making tally marks.

Center 6: More/Fewer/Same Balance

1. Students are given a group of manipulatives.
2. One student puts a chosen number of manipulatives on one side of the balance and another student puts a chosen number of manipulatives on the opposite side of the balance.
3. Compare the manipulatives by looking at the balance to see which way it is leaning. (Students have been taught that the larger the number the more it weighs.)
4. The students then compare the number of manipulatives.
5. Which group has more?
6. Which group has less?
7. The manipulatives are taken off of the balance one side at a time and counted.
8. The students findings are recorded on the *More/Fewer/Same* recording sheet.
9. The number of manipulatives may be increased as students become number proficient.

Assessment Suggestions

- The math journal is an excellent way for you to evaluate a student's mathematical thinking.
- Observations: These can be recorded on small sticky notes or on an *Observation Sheet*. Make notes about students that need to be pulled into a small group for extra help.
- A *Math Check list* is kept to keep track of students' progress.
- Ask probing questions to focus students' thinking when using manipulatives.
- Have students share their thinking about the activity.
- Collect any recording sheets. This will give you time to make an in-depth assessment of a student's number sense.

Curriculum Extensions/Adaptations/Integration

- Use the different stages of activities to meet the needs of your students.
- Ask mathematical questions during Language Arts and Content time.
- All students can use centers. Adaptations in quantity of numbers can be adjusted to meet the specific needs of each student.
- Center activities should be taught to the whole group and then placed in a center for students to practice and become proficient in the subject matter.

Family Connections

- Have the students take home a *More and Fewer* recording sheet. Have the students look around their houses. Tell them to draw/write the name of something they have more of in their homes and something that they have less of in their homes (e.g., draw a picture of a chair in the more column and a picture of an oven in the less column).
- The alligator puppet could be sent home with a *More and Fewer* recording sheet. The students and their families could look around their homes for items that they have more/fewer of and record their findings on the recording sheet.
- Math Night- Parents would be invited to make the math activities for their homes.

Additional Resources

Books

Just Enough Carrots, by Stuart J. Murphy; ISBN 0-06-026778-X (Children's Book)

Moo-ving into Math Journals, by Margaret Allen, Ph.D.; ISBN 0-9722832-0-X (Professional Book)

More or Less?, by Judy Nayer; ISBN 1-56784-954-7 (Big Book)

More, Fewer, Less, by Tana Hoban; ISBN 0-688-15694-0 (Children's Book)

Web sites

<http://coreacademy.usu.edu> (Materials 2008)

<http://illuminations.nctm.org> (Math Lesson Plans)

<http://kidscount1234.com>











http://lessonplanz.com/Lesson_Plans/Mathematics/_Grades_K-2/index.shtml
<http://mrspohlmeyerskindergarten.com/mathsense.htm>
<http://www.aaamath.com/cmpk1a-morefewer.html> (On-line Math Game)
<http://www.alfy.com> (On-line Math Games)
<http://www.drmaggieallen.net>
<http://www.funbrain.com>
<http://www.kellyskindergarten.com/math/mathactivities>
http://www.kidport.com/GradeK/Math/NumberSense/MathK_Sequence.htm (On-line Math Games)
<http://www.kidport.com/GradeK/Math/NumberSense/MathKNumbers.htm> (On-line Math Games)
<http://www.littlegiraffes.com>
<http://www.mathsolutions.com>
<http://www.theteacherscorner.net/lesson-plans/math/numbersense/index.htm>
<http://www.toddlerivillage.net>

Organizations

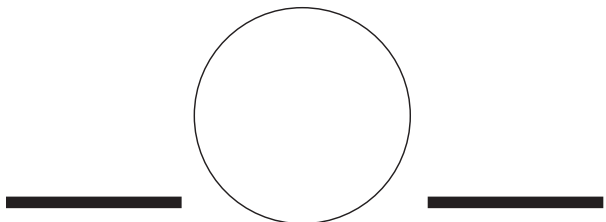
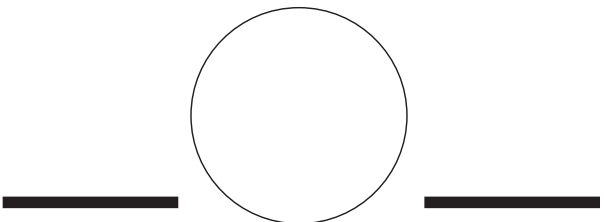
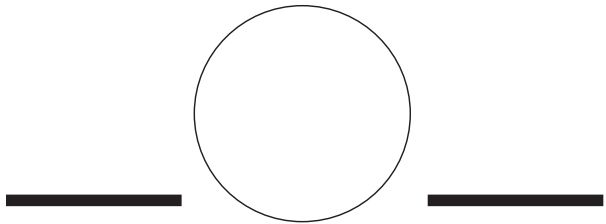
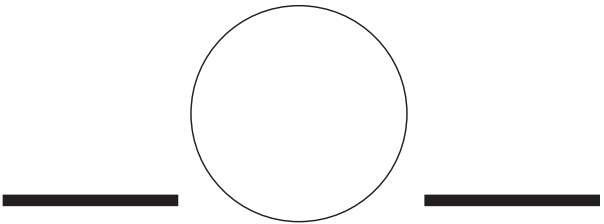
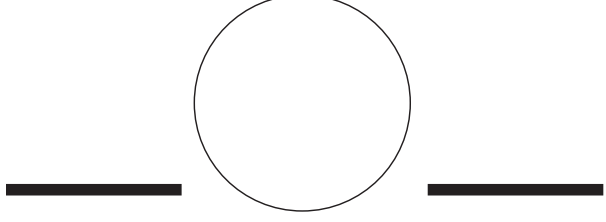
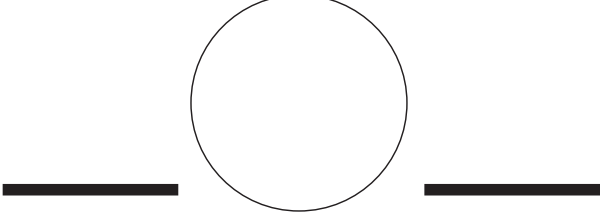
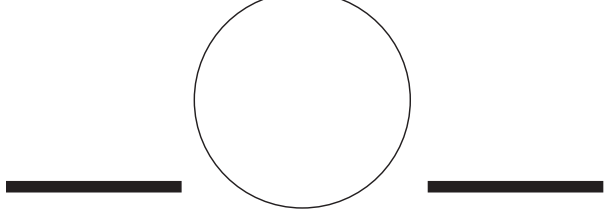
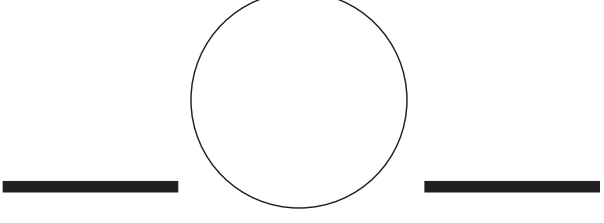
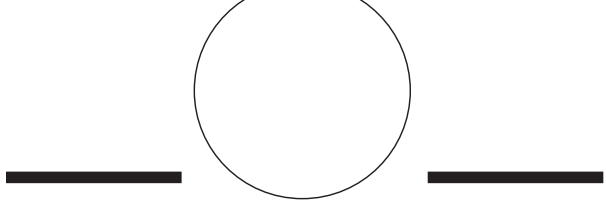
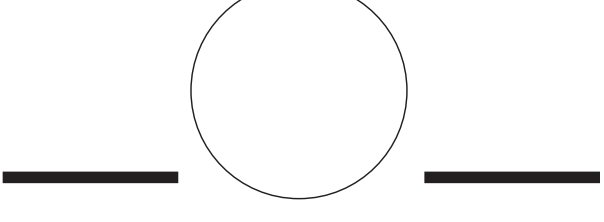
National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502 (703) 620-9840, <http://www.nctm.org>

National Association for the Education Of Young Children, 1509 16th St. N.W., Washington, DC 20036 (202) 232-8777 or (800) 424-2460, <http://naeyc.org>

Alligator More and Fewer

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More/Fewer/Same

Math Check List

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Numbers Through the Year

Math Standard I

Objective 1

Connections

Standard I:

Students will understand simple number concepts and relationships.

Objective 1:

Identify and use whole numbers up to 30.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written and nonverbal form.

Content Connections:

Mathematics III-2; Comparing measurable attributes,
Language Arts I-1; Listening,
Language Arts III-1; Counting,
Language Arts V-1; Reading grade level text,
Language Arts VIII-5; Using fluent and legible numeral writing

Background Information

Number sense is described as a person's ability to understand and use numbers. Some scientists believe that humans are born with number sense or an innate ability to comprehend, process, and manipulate numbers. If we in fact have this innate ability then why do so many people struggle with mathematics? We need to cultivate a positive attitude towards math. This will certainly help facilitate confidence in our students thus improving student achievement.

Here are some suggestions of activities that will help build a student's confidence in math:

- Encourage students to explore groups of objects using manipulatives.
- Talk about numbers!
- Give students an opportunity to use numbers to solve problems.

Students struggling with number sense should be explicitly taught number representation, number comparison, number order, number patterns, number estimation, and joining and separating of number sets. Helping students build number sense right from the start, in kindergarten, gives students the background and the confidence they will need to succeed in the future with mathematics.

Research Basis

Clements, D. H. (1999). 'Concrete' manipulatives, concrete ideas. *Contemporary Issues in Early Childhood*, 1(1), 45-60.

Students who use manipulatives in their mathematics classes usually outperform those who do not. This benefit holds across grade level, ability level, and topic, given that use of a manipulative “makes sense” for that topic. Manipulative use also increases scores on retention and problem solving tests. Attitudes toward mathematics are improved when students have instruction with concrete materials provided by teachers knowledgeable about their use.

Burns, M. (April 1996). How to Make the Most of Math Manipulatives. *Instructor Magazine*. 45-50.

7 Musts for Using Manipulatives:

1. Talk to students about why manipulatives help them learn.
2. Set ground rules for using materials.
3. Set up a system for storing materials and familiarize students with it.
4. Time for free exploration is worth the investment.
5. Post class charts about manipulative materials.
6. Manipulatives are a natural for writing assignments.
Manipulatives provide concrete objects for children to describe.
7. Let parents get their hands on manipulatives, too. It's important for parents to understand why their children are using materials.

Moyer, P. & Jones G. (2004). Controlling Choice: Teachers, Students and Manipulatives in Mathematics Classrooms. *School Science and Mathematics*. Vol. 104.

Manipulatives are designed to represent explicitly and concretely abstract mathematical ideas. Research on their use has shown that students who use manipulatives during learning outperform those who do not.

Invitation to Learn

Introduce the Tricky Teen Song on a chart. Later, have the students hold up number cards as you sing the song.

The Tricky Teen Song

(Tune: “Row, Row, Row Your Boat”)

Do you know the tricky teens?

Sing them with me!

1 0 is ten.

1 1 is eleven.

1 2 is twelve.

1 3 is thirteen.

1 4 is fourteen

1 5 is fifteen.

1 6 is sixteen.

1 7 is seventeen.

1 8 is eighteen.

1 9 is nineteen.

Now you know the tricky teens!

You sang them with me.

Tricky teens are lots of fun.

Wouldn't you agree?

Instructional Procedures

Materials

- ☐ 2 Small rings per child
- ☐ Index cards
- ☐ Scissors



Number Generator

1. Each child will need 7 plain index cards.
2. Cut 6 index cards in half.
3. Use one full index card as the back of the Number Generator.
4. Have students write numbers 1, 2, and 3 on individual cards.
5. Punch the cards at the top left corner.
6. Attach numbers 1-3 with a ring on the left side of the full index card. (Numbers should be in order.)
7. Have students write numbers 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9 on individual cards.
8. Punch the cards at the top right corner.
9. Attach numbers 0-9 with a ring on the right side of the full index card. (Numbers should not be in order)
10. Now, you are ready to make numbers from 0-30.
11. Have the students make numbers with the Number Generator and hold it up for you to assess their success.

The Plate Game

Stage One:

1. Divide the class into groups of 3-4 students.
2. Provide each group with paper plates numbered from 0-10 (not in order).
3. Spread the groups out around the room.
4. Inform the students that each team needs to put the plates in the correct number order.
5. Give the signal to begin!
6. Have the team sit down when they have put their plates in the correct number order.
7. The first team that sits down and has their paper plates in consecutive order wins.

Stage Two:

1. Divide the class into groups of 3-4 students.
2. Provide each group with manipulatives. (Remember, you will need more manipulatives for higher numbers.)
3. Students are informed that the team that puts the plates in correct number order, with the correct number of manipulatives on their plates will be pronounced the winner.
4. Give the signal to start the game.
5. Have the teams sit down when they have completed the task.
6. Check the performance of the team that sits down. Make sure that their plates are in number order and count, with the group, the manipulatives on each plate. If they are correct, they are pronounced the winners.
7. The game continues if the first team makes a mistake and is eliminated from the competition.
8. This process continues until a winner is declared.

Ring and Do

Part One:

1. Each student has his/her own paper plate and access to small manipulatives.
2. The teacher/student draws a number card but does not show it to the group.

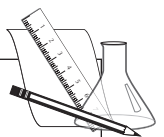
Materials

- ☐ Paper plates
- ☐ Manipulatives



Materials

- ☐ Paper Plates
- ☐ Manipulatives
- ☐ Bell
- ☐ Number Cards
- ☐ Markers/Chalk
- ☐ Response Board



3. The teacher/student rings the bell the number of times indicated on the number card.
4. Each student puts that number of manipulatives on their paper plate.
5. As a group, count to the number on the number card as the students remove the manipulatives from their plates.
6. Check for understanding.

Part Two:

1. Each student has a chalkboard/marker board and a writing utensil.
2. The teacher/student draws a number card but does not show it to the group.
3. The teacher/student rings the bell the number of times indicated on the number card.
4. Each student then writes down the number of rings that he/she heard.
5. As a group, students show their answers by holding up their boards.
6. Check for understanding.

Materials

- ☐ Number Pocket Chart
- ☐ Number Cards



Materials

- ☐ Ten-Frame Dot Cards
- ☐ Blank Ten-Frames
- ☐ Counters



What's Missing?

1. Have a number pocket chart displayed at the front of the classroom.
2. Place the numbers in a pattern on the number chart. (Use different patterns throughout the year.)
3. Secretly remove a number from the number chart.
4. Have one student identify the color of the missing number and another student identify the missing number.
5. Point out how each child came up with his/her answer. (This is valuable for students who are having a difficult time coming up with an answer.)
6. Continue this process several times.

Memory Frames

1. Each student is given a *Blank Ten-Frame Card*.
2. The teacher has a variety of *Ten-Frame Dot Cards*.
3. The teacher holds up one *Ten-Frame Dot Card* for 5 seconds.

4. The students are asked to use the counters to reproduce the dot card that was shown.
5. Students are told to complete the task quickly and to the best of their ability.
6. The teacher walks around checking progress.
7. The teacher displays the *Ten-Frame Dot Card* that was shown to the group.
8. Ask: How many put the counters in the correct place?
9. Ask: How many knew the right number but had the counters in the wrong place?

This game can be used all year. Teachers can hold up two or three *Ten-Frame Dot Cards* at a time to make numbers up to 30.

Center 1: Number Stamp

1. Each student will receive a *Number Stamp* recording sheet.
2. Students will stamp a number in one or two boxes on the left side of the sheet (e.g., If the student stamps a number 1 and a number 6 then he/she creates the number 16).
3. Students will then use a marker stamp pen and stamp the corresponding amount in the box on the right side of the recording sheet (e.g., The student will stamp with the stamp pens 16 times).
4. Students can use this activity to create numbers from 0-99.
5. Students should use the red marker to self-correct their paper.
6. Journal Activity: Stamp a number on the journal page and use the marker stamps to represent that number.

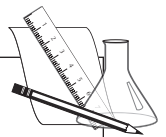
Center 2: Bead Counters

Stage One:

1. The *Numbered Bead Cards* will need to have a hole punched on the right side (not close to the edge).
2. Knot a shoelace at the back and the front of the *Numbered Bead Cards*.
3. Have the students look at the first number on the *Numbered Bead Card* and string the beads on the shoelace to match that number.
4. Have the students put a paper clip on the end of the completed shoelace. This will hold the beads in place until the teacher can check it.

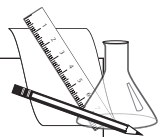
Materials

- ☐ *Number Stamp*
- ☐ Number Stamps
- ☐ Stamp Pad
- ☐ Marker Stamp Pens
- ☐ Red Marker
- ☐ Math Journal



Materials

- ☐ *Numbered Bead Cards*
- ☐ Shoelaces
- ☐ Beads
- ☐ Paper Clips
- ☐ Paper Punch



5. Have the students count the beads that have been strung and self-correct their work.
6. Students repeat this process with the next number on the card.
7. Students may have time to complete several cards during a center time.
8. Journal Activity- Have the students choose one number card to represent in their journal. Have the students write the number, draw a line on their paper, and then color circles to represent the beads that were strung on the card.

Stage Two:

The beads could be strung in patterns.

Materials

- ☐ Spin-A-Number
- ☐ Game Spinners
- ☐ Crayons/Colored Pencils
- ☐ Red Marker
- ☐ Math Journal



Center 3: Spin-A-Number

1. Each student will need a *Spin-A-Number Recording Sheet*.
2. Students spin the spinner.
3. Students will write the number on the recording sheet and then color in that number of squares to represent the number.
4. This process continues by spinning again and recording the number until the sheet is completed.
5. Have students self-correct their work with the red marker.
6. Journal Activity- Have the students spin a number and record the number in their journal. Have the students draw a picture of that number of objects in their journal.

Materials

- ☐ Fish Pattern
- ☐ Cardstock
- ☐ Fishing Pole
- ☐ String
- ☐ Magnet
- ☐ Small Magnetic Strips
- ☐ Tub
- ☐ Number Recording Sheet
- ☐ Math Journals
- ☐ Writing Utensils



Center 4: Fishing for Numbers

Part One:

1. Copy the Fish Pattern onto cardstock and write numbers from 0-10 on the fish.
2. Copy the Fish Pattern onto cardstock and make dots to match the numbers from 0-10.
3. Cut and laminate the fish.
4. Place a small magnetic strip on the back of each fish.
5. Decorate a tub to look like water.
6. Place the fish in the tub.
7. Make a fishing pole with a dowel, string, and a magnet.
8. Have the students take turns catching a fish.
9. Match the numbered fish with the fish with dots.

10. Journal Activity: Have the students catch fish from the tub. The students will then draw a fish and record the number that was on the fish in their journals. Have the students draw small circles to represent that number so that they look like bubbles coming from the fish. Students could write the numbers in the bubbles from 0 to the number that was caught.

Part Two:

Have the students put the fish that are caught in numerical order from 0-10, 0-20, 0-30.

Part Three:

Have the students record the number on the fish on a *Number Recording Sheet*.

Center 5: Ten Frame Counting

Part One:

1. Give each student a small container of counters.
2. The student spins the spinner.
3. On the Ten Frame card, the student places the same number of counters indicated on the spinner.

Part Two:

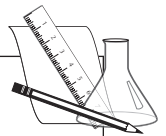
Students will record their spin on the Ten Frame recording sheet.

Part Three: Part of the Whole

1. Give each student a small container of counters and several ten frame cards with 5 spaces filled in.
2. The student spins the spinner that is numbered from 6 to 10.
3. The student fills in the missing part to make the number whole (e.g., if the student spins seven then they will need to put 2 counters on the *Ten Frame* card to make the number 7).
4. Students record their spin on the *Ten Frame- Part of the Whole* recording sheet.
5. This process can continue with numbers up to twenty and thirty. A spinner will need to be made for higher numbers, and recording sheets are available at www.coreacademy.usu.edu.

Materials

- ☐ Counters
- ☐ Ten Frame
- ☐ Ten Frame Recording Sheet
- ☐ Ten Frame- Part of the Whole
- ☐ Spinner



Assessment Suggestions

- The math journal is an excellent way for you to evaluate a student's mathematical thinking.

- Observations: These can be recorded on small sticky notes or on an Observation Sheet. Make notes about students that need to be pulled into a small group for extra help.
- Ask probing questions to focus students' thinking when using manipulatives.
- Have students share their thinking about the activity.
- Collect any recording sheets. This will give you time to make an in-depth assessment of a student's number sense.

Curriculum Extensions/Adaptations/Integration

- All students can use centers. Adaptations in quantity of numbers can be adjusted to meet the specific needs of each student.
- Center activities should be taught to the whole group and then placed in a center for students to practice and become proficient in the subject matter.
- Numbers should be talked about in all curriculum areas (e.g., How many pages are in this book? or How many seasons are in a year?).

Family Connections

- Number Writing Sheets 0-30 could be sent home for writing practice.
- Number Book 0-30 could be sent home for number representation and writing practice.
- Math Night – Parents would be invited to make the math activities for their homes.

Additional Resources

Books

Number Books from 0-10

10 for Dinner, by Jo Ellen Bogart; ISBN 0-590-71949-1

A-Counting We Will Go, by Rozanne Lanczak Williams; ISBN 0-916119-93-9

Anno's Counting Book, by Mitsumasa Anno; ISBN 0690012888

Bat Jamboree, by Kathi Appelt; ISBN 0-590-76767-4

City By Numbers, by Stephen T. Johnson; ISBN 0-14-056636-8

Count and See, by Tana Hoban; ISBN 0-02-744800-2
Count!, by Denise Fleming; ISBN 0-8050-4252-0
Emeka's Gift, by Ifeoma Onyefulu; ISBN 0-14-056500-0
Feast for 10, by Cathryn Falwell; ISBN 0395620376
How Many?, by Judy Nayer; ISBN 1-56784-307-7 (Big Book)
Moja Means One, by Muriel Feelings; ISBN 0-14-054662-6
More Than One, by Miriam Schlein; ISBN 0-590-10734-8
One, Two, Skip A Few! First Number Rhymes, Illustrated by Roberta Arenson; ISBN 0-439-22786-0
Ten Black Dots, by Donald Crews; ISBN 0-688-13574-9
Ten Cats Have Hats, by Jean Marzollo; ISBN 0-590-47056-6
Ten Little Rabbits, by Virginia Grossman and Sylvia Long; ISBN 0-8118-1057-7
The Gummy Candy Counting Book, by Amy and Richard Hutchings; ISBN 0-590-34127-8
The Icky Bug Counting Book, by Jerry Pallotta; ISBN 0881066907
Who's Counting?, by Nancy Tafuri; ISBN 0-590-48904-

Number Books from 0-20

Bears At The Beach, by Niki Yektai; ISBN 0-7613-0047-3
Cat Up A Tree, by John and Ann Hassett; ISBN 0-395-88415-2
Count and See, by Tana Hoban; ISBN 0-02-744800-2
Counting Is For The Birds, by Frank Mazzola Jr.; ISBN 0-88106-951-5
Counting Our Way to Maine, by Maggie Smith; ISBN 0-531-06884-6
Dragon Naps, by Lynne Bertrand; ISBN 0-670-85403-4
How Many? How Much?, by Rosemary Wells; ISBN 0-329-23384-X
Math Counts Counting, by Henry Pluckrose; ISBN 0-516-05452-X
Monster Munchies, by Laura Numeroff; ISBN 0-679-99163-8
One Woolly Wombat, by Rod Trinca and Kerry Argent
The Handmade Counting Book, by Laura Rankin; ISBN 0-8037-2309-1

Media

Math Circus, by Leap Frog (www.leapfrog.com); ISBN 0-7907-9948-0
Winnie the Pooh 123's, by Disney Learning Adventures; ISBN 0-788-4998-0

Web sites

<http://coreacademy.usu.edu> (Participant Handbook and Materials Kindergarten 2008 and 2007)
<http://illuminations.nctm.org> (Math Lesson Plans)
<http://kidscount1234.com>
http://lessonplanz.com/Lesson_Plans/Mathematics/Grades_K-2/index.shtml
<http://mrspohlmeyerskinderpage.com/mathsense.htm>
<http://www.alfy.com> (On-line Math Games)
<http://www.drmaggieallen.net>
<http://www.funbrain.com>

<http://www.kellyskindergarten.com/math/mathactivities>

http://www.kidport.com/GradeK/Math/NumberSense/MathK_Sequence.htm (On-line Math Games)

<http://www.kidport.com/GradeK/Math/NumberSense/MathKNumbers.htm> (On-line Math Games)

<http://www.littlegiraffes.com>

<http://www.mathsolutions.com>

<http://www.mrsjonesroom.com/song/teenchant/html> (Tricky Teen Chant)

<http://www.theteacherscorner.net/lesson-plans/math/numbersense/index.htm>

<http://www.toddlerivillage.net>


Organizations



National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502 (703) 620-9840, <http://www.nctm.org>

National Association for the Education Of Young Children, 1509 16th St. N.W., Washington, DC 20036 (202) 232-8777 or (800) 424-2460, <http://naeyc.org>




Blank Ten Frame





Ten Frame Cards






				







Ten Frame Cards








				









Ten Frame Cards

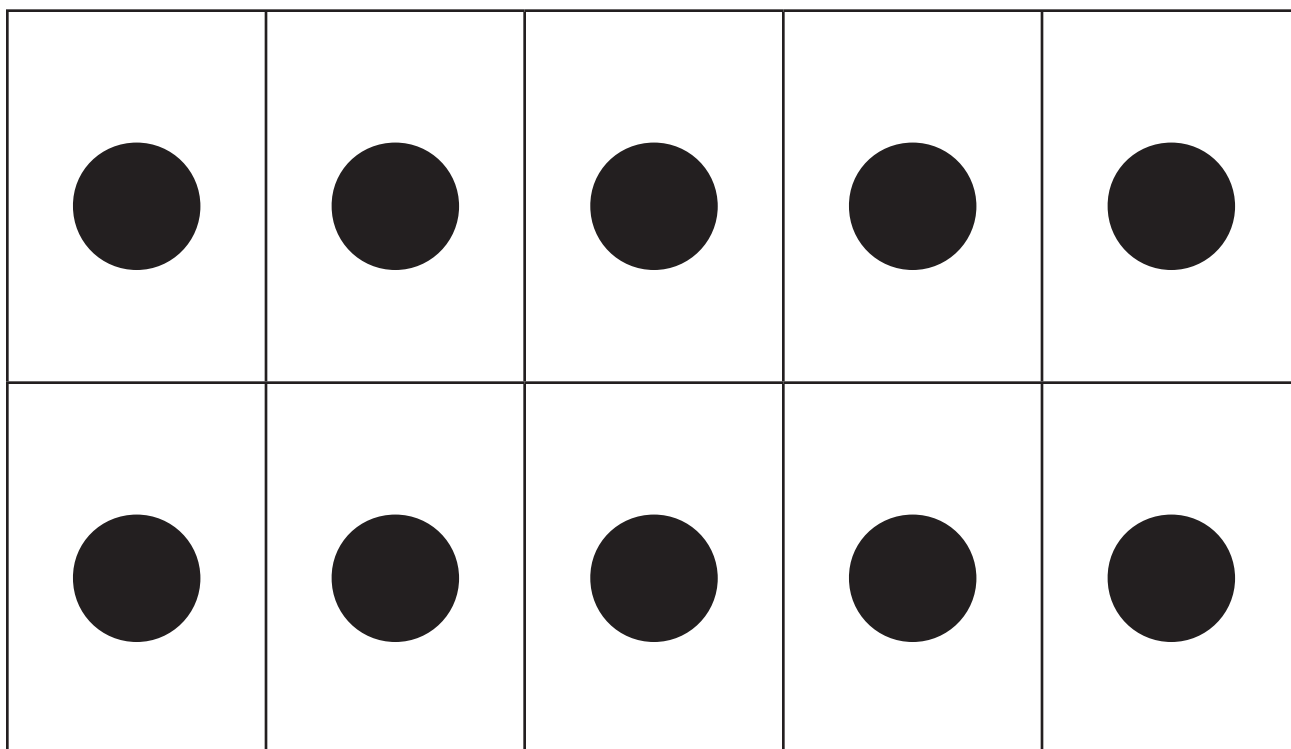
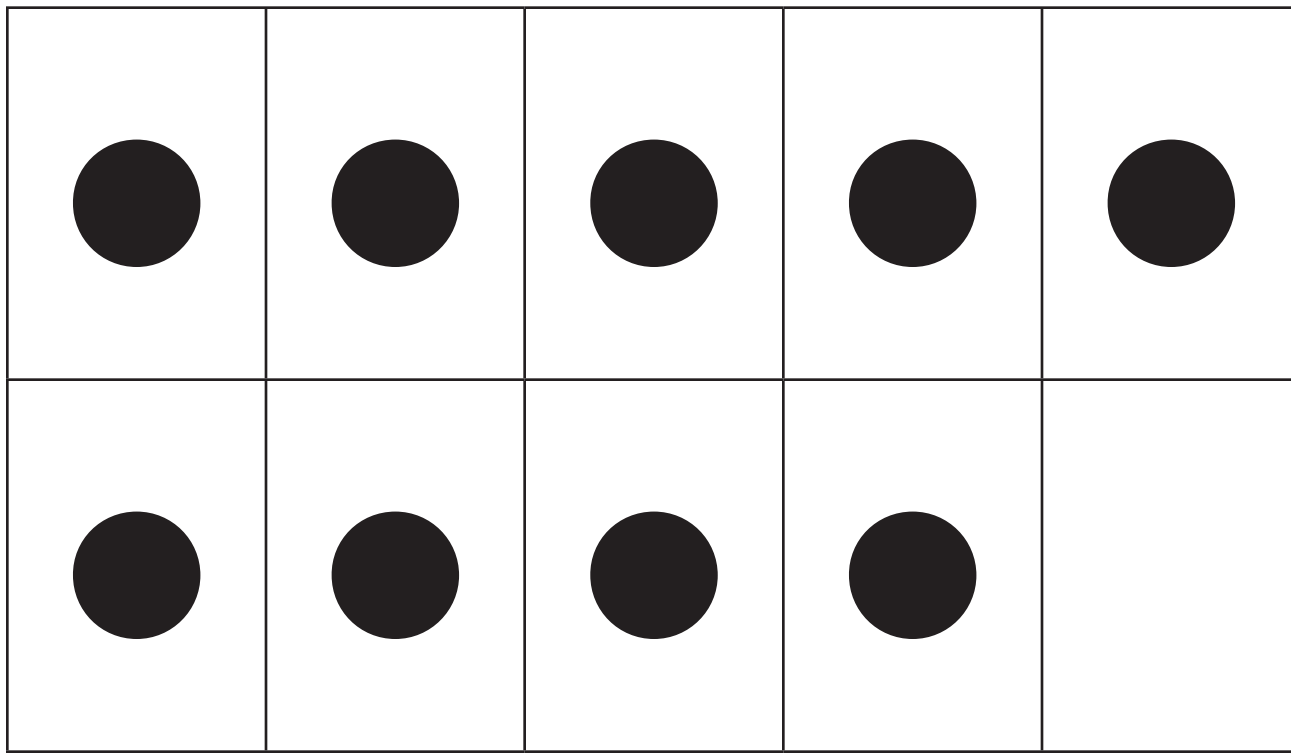
				
				

Ten Frame Cards

Ten Frame Cards



Number Stamp

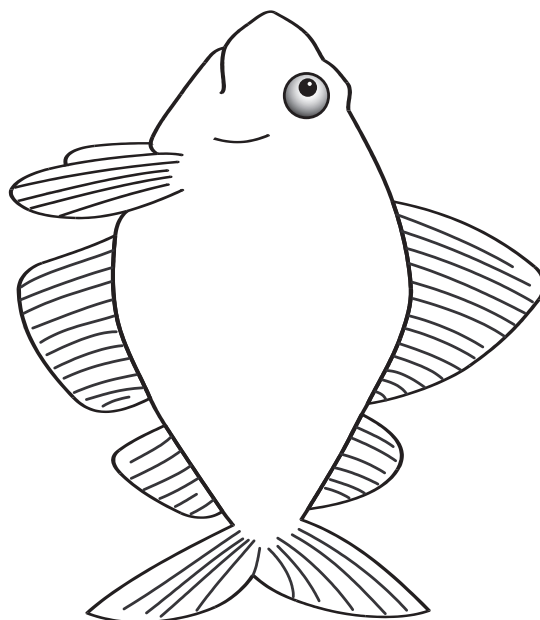
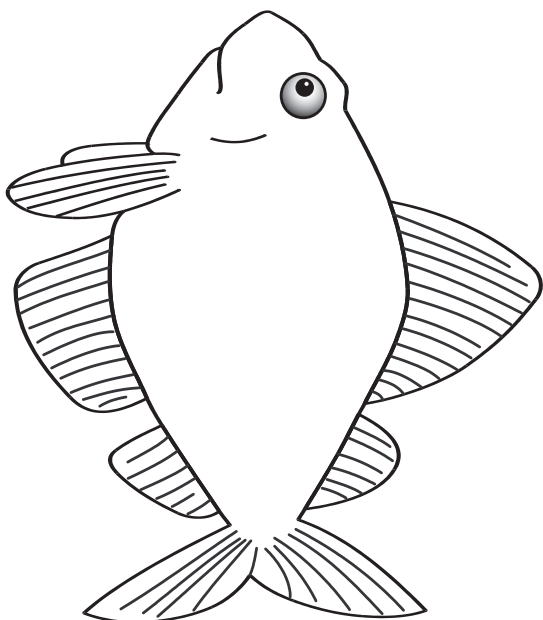
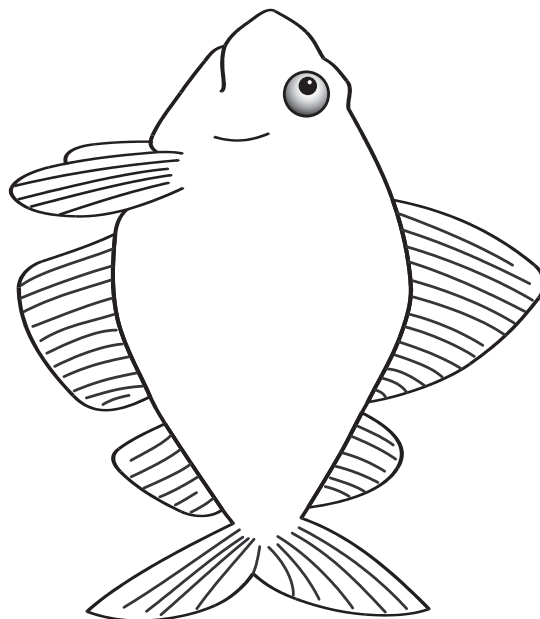
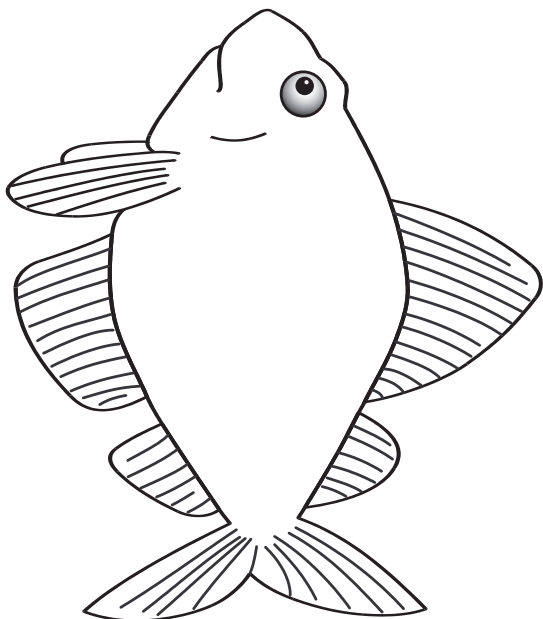
Numbered Bead Cards

10	3
8	9
7	5
4	2

Name _____

Spin-A-Number

Fish Pattern



Name _____

Number Recording Sheet 0-10

Ten Frame Recording Sheet

Ten Frame - Part of Whole

●	●	●	●	●

●	●	●	●	●

●	●	●	●	●

●	●	●	●	●

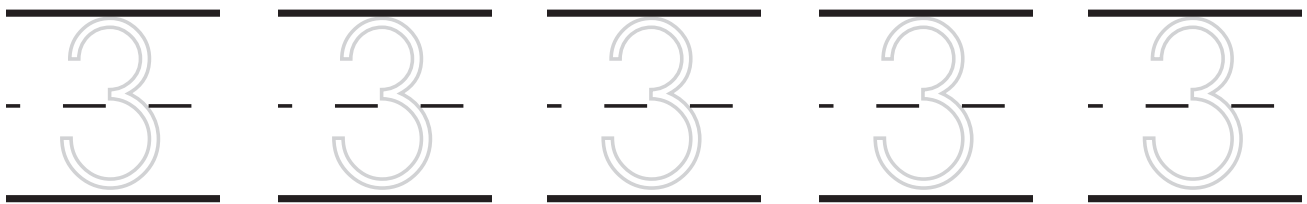
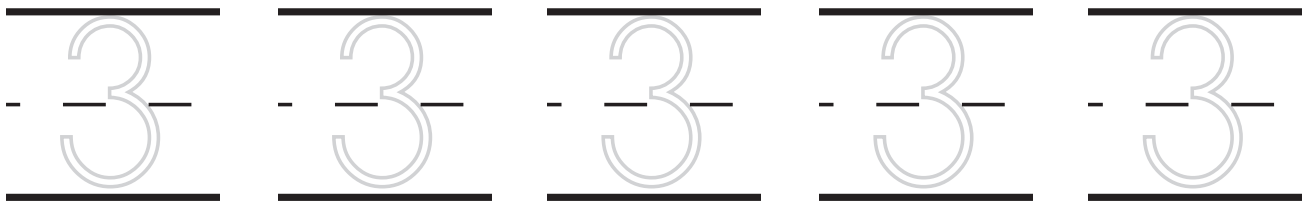
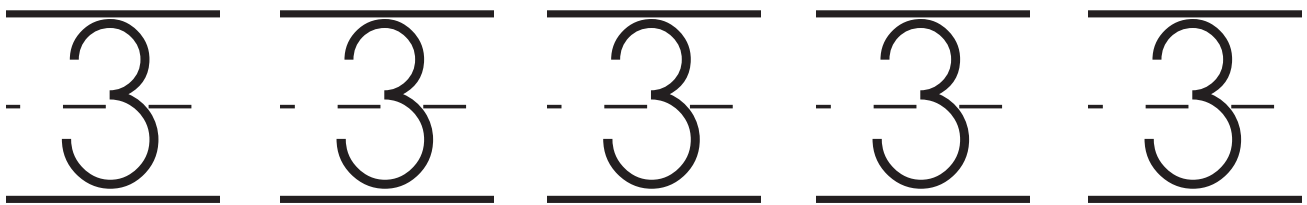
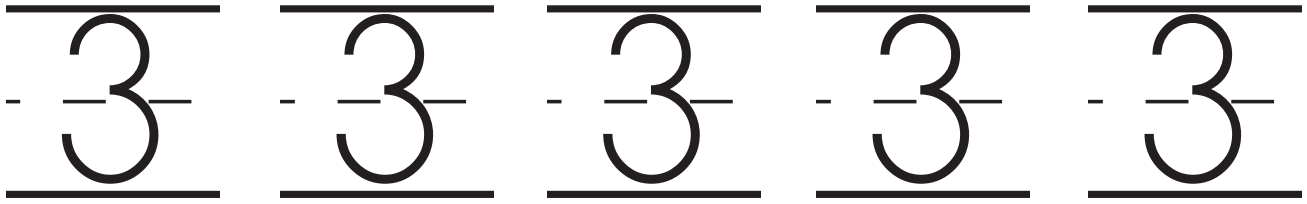
●	●	●	●	●

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●	●	●	●	●

●	●	●	●	●

Number Writing



Three

Math I-3

Activities

Joining & Separating

Double those Ducks!

Standard I:

Students will understand simple number concepts and relationships.

Objective 3:

Model, describe, and illustrate meanings of addition and subtraction for whole numbers less than ten.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:

Math I-3; Joining and separating sets
 Language Arts I-1; Effective communication
 Language Arts VIII-5; Legible handwriting

*Math
Standard
I*

*Objective
3*

Connections

Background Information

Addition, or joining of sets, is a basic concept most children know instinctively. Yet, as they make the transition from completely concrete to symbolic, some students become confused. Other students may be able to do symbolic addition without understanding that numerals represent real numbers and objects. To help them begin this transition, the use of manipulatives, later coupled with numerals, is an essential step to complete understanding. The ability to create their own math stories also helps them connect addition with the real world.

Kindergarten teachers need to provide repeated, varied activities for practice in joining sets. As students continue to practice, incorporating their own stories for each problem, as well as using numbers to describe the stories, they will make the connection between the real world and the symbolic.

Research Basis

Moyer, P. S. (2001). Are We Having Fun Yet? How Teachers Use Manipulatives to Teach Mathematics. *Educational Studies in Mathematics*. 47 (2) 175-197.

Manipulatives may serve as tools for teachers to translate abstractions into a form that enables learners to relate new knowledge to existing knowledge. This requires teachers to guide students to translate between representation in the form of mathematical objects, actions, and abstract concepts so that students can see the relationship between their knowledge and new knowledge.

Murray, A. (2001). Ideas on Manipulative Math for Young Children. *Young Children*. 56 (4) 28-29.

“Math is tangible. Children learn better when they’re using their senses; therefore, they should complete math tasks using three-dimensional objects to represent the numbers under examination.” The use of manipulatives involves multiple senses and increases the probability that each learner will make the necessary connections between the abstract and concrete in joining of sets.

Invitation to Learn

Gather the children and ask, “Do any of you have pets?” “How do you take care of your pets?” “What things do you need to take care of your pets?” Tell the students that you will be reading a story about a boy who had four ducks for pets, how he took care of their needs, and what happened when the ducks made some new friends.

Instructional Procedures

Materials

- ☐ *Double the Ducks Cutouts*
- ☐ *Double the Ducks*



Double the Ducks

1. Read *Double the Ducks* to the class. As you read, discuss the problems the boy faces.
2. Using the *Double the Ducks* cutouts on the board, have the students retell the story.
3. After retelling, regroup the cutouts into individual math problems and write corresponding numbers on the board.

NOTE: All of the following activities can be done on three levels.

1. **Concrete**: where the activity is done with manipulatives only.
2. **Pictorially**: where students draw to record what they have done with the manipulatives.
3. **Symbolic**: where they add numbers to their concrete or pictorial representations.

Materials

- ☐ *Duck Storyboards*
- ☐ Duck manipulatives
- ☐ Paper strips
- ☐ 1 set of duck story boards per student
- ☐ Pencil



Duck Story Boards

1. Give each student a set of *Duck Storyboards* and 10 manipulatives.
2. Demonstrate and tell an addition story on your storyboard.
3. The students will tell addition stories on their storyboards using manipulatives.

- On subsequent days, the students will tell addition stories on their boards, then write the corresponding number sentence on the paper strips (2" x 8").

Doubled Duck Match

- Students place all cards face down.
- On each turn, a student will turn over two cards. If they have the same number of ducks, they keep the card. If they do not, they turn them back over. This continues until all of the duck cards have been matched.
- The students take each match, add the two cards together, and record on the *Doubled Duck Match Recording*.

Materials

- ☐ Duck match cards
- ☐ *Doubled Duck Match Recording*
- ☐ Pencil



Double Up

- Make a stack or line with 1 to 5 manipulatives. Make another stack or line of the same size next to it.
- Add the two stacks or lines and record on the white board or chalkboard.

Materials

- ☐ Manipulatives
- ☐ Response boards
- ☐ Markers/chalk

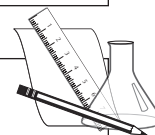


Geoboard Doubles

- Demonstrate making one square on your geoboard. Instruct the students to also make one square. Then double the square to two squares. Continue doubling squares on the board with the students.
- Demonstrate filling in the *Geoboard Doubles Recording* as you double the squares.
- Students will now create their own doubles on the geoboard.
- Record what they did on the *Geoboard Doubles Recording*, filling in the numbers to make an equation.
- Continue the process for additional doubles.

Materials

- ☐ Geoboards
- ☐ Elastics
- ☐ *Geoboard Doubles Recording*
- ☐ Pencil



Double Draw

- Students draw a Number Card from the container.
- They count out that number of manipulatives and write it on the paper.
- They double the number of manipulatives they drew out and write it, then add the two numbers.
- Continue the process until all the numbers have been drawn.

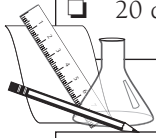
Materials

- ☐ Number cards
- ☐ Manipulatives
- ☐ Paper
- ☐ Container
- ☐ Pencil



Materials

- ☐ Double Duck Ditty
- ☐ 20 ducks



Materials

- ☐ Journal – one journal idea per page



Materials

- ☐ Dot painter
- ☐ Art paper
- ☐ Pencil



Double Duck Ditty

1. Sing each verse of the song, adding the correct amount of ducks on the board as you sing.

Double Duck Journal

1. Give the students one journal page per day.
2. Students illustrate the journal entry.

Double Dot Addition

1. Students dot on the first section of the paper 1-5 dots and write the number below.
2. Students fold the paper over, duplicating (doubling) the dots, and write the number below.
3. On the third section, write the total.

Assessment Suggestions

- Journal pages are excellent assessments.
- Make observations of students during small group and individual activities.
- Recording sheets from individual and small group activities can be collected for assessment.
- As students work on the individual and small group activities, ask them to explain what they are doing and how they are deriving the answers.

Curriculum Extensions/Adaptations/Integration

- Advanced Learners: All these activities are designed for numbers 10 and below. Working with higher numbers will increase the challenge.
- Advanced Learners: Create their own journal ideas, solve, and illustrate.
- Special Needs Learners: Start with smaller numbers.
- Special Needs Learners: Work one on one with teacher on journal entries.
- Science Integration: Incorporate with study of birds, ducks, farm and domestic animals.

- Language Arts: Act out the story. Write stories about ducks and the story boards.

Family Connections

- With an adult's help, students can help prepare a simple recipe and double it for their family.
- Students can share their doubling stories with their families.

Additional Resources

Books

Double the Ducks, by Stuart J. Murphy; ISBN 0-06-028922-8

One of Each, by Mary Ann Hoberman; ISBN 0-590-51437-7

Domino Addition, by Lynette Long, Ph.D.; ISBN 0-88106-877-2

Jack the Builder, by Stuart J. Murphy; ISBN 0-06-055775-3

Quack and Count, by Keith Baker; ISBN 0-15-205025-6

Ten Little Rabbits, by Virginia Grossman and Sylvia Long; ISBN 0-440-83653-0

Developing Number Concepts Addition and Subtraction, by Kathy Richardson; ISBN 0-7690-0059-2

Articles

7 Musts for Using Manipulatives, by Kathy Richardson; Instructor Magazine, April 1996

Tips on using Manipulatives, by Norman Labush; Didax Educational Resources, <http://www.didax.com>

"Concrete" Manipulatives, Concrete Ideas, by Douglas H. Clements; Didax Educational Resources, <http://www.didax.com> from previously published article in Contemporary Issues in Early Childhood, 1(1), 45-60

Early Childhood Mathematics: Promoting Good Beginnings, by the National Association for the Education of Young Children (NAEYC) and the National Council for Teachers of Mathematics (NCTM), 2002

Number Talks: Thinking with Numbers, by Kathy Richardson; Didax Educational Resources, <http://www.didax.com>

Web sites

<http://www.didax.com>

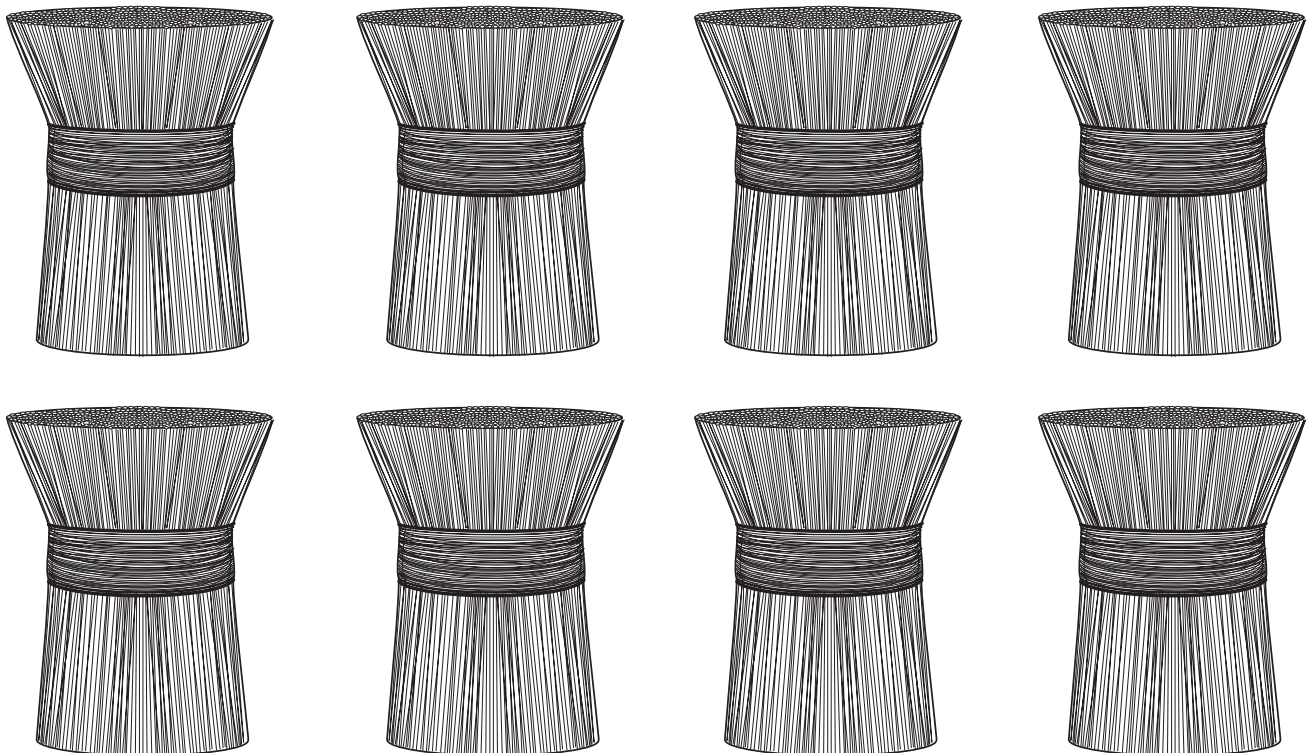
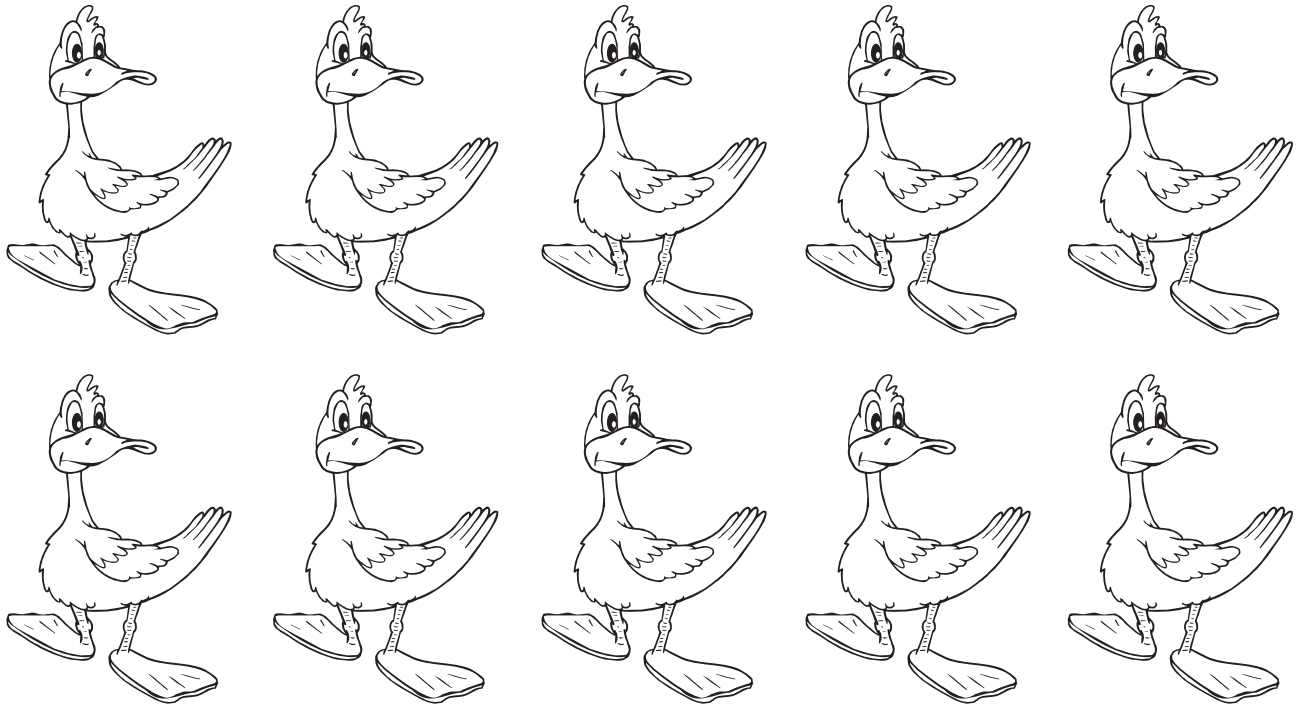
<http://www.illuminations.nctm.org>

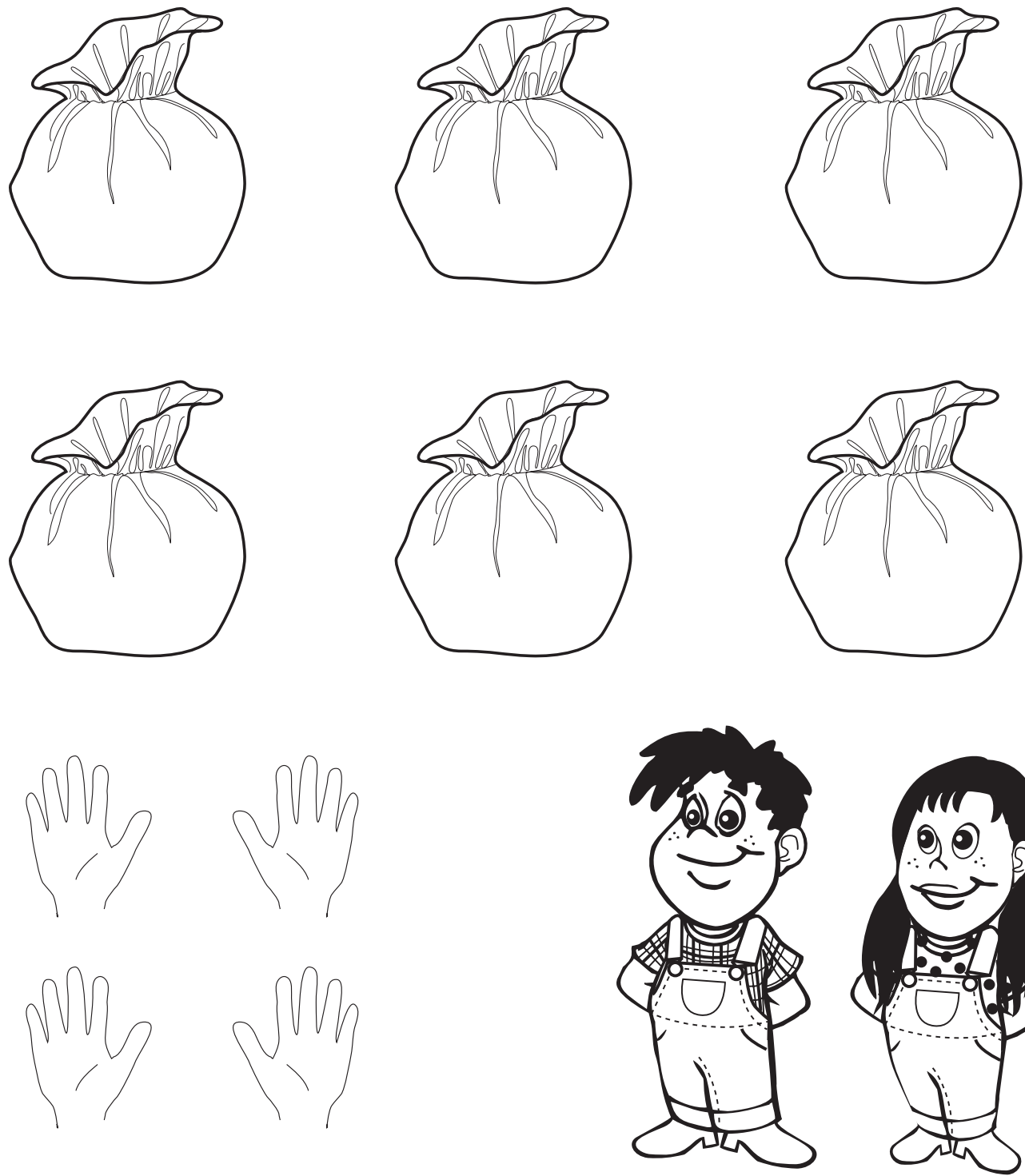
Organizations

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National Association for the Education of Young Children, 1509 16th Street N.W., Washington D.C. 20036 (202) 232-8777 or (800) 424-2460, <http://www.naeyc.org>

Double the Ducks Cutouts

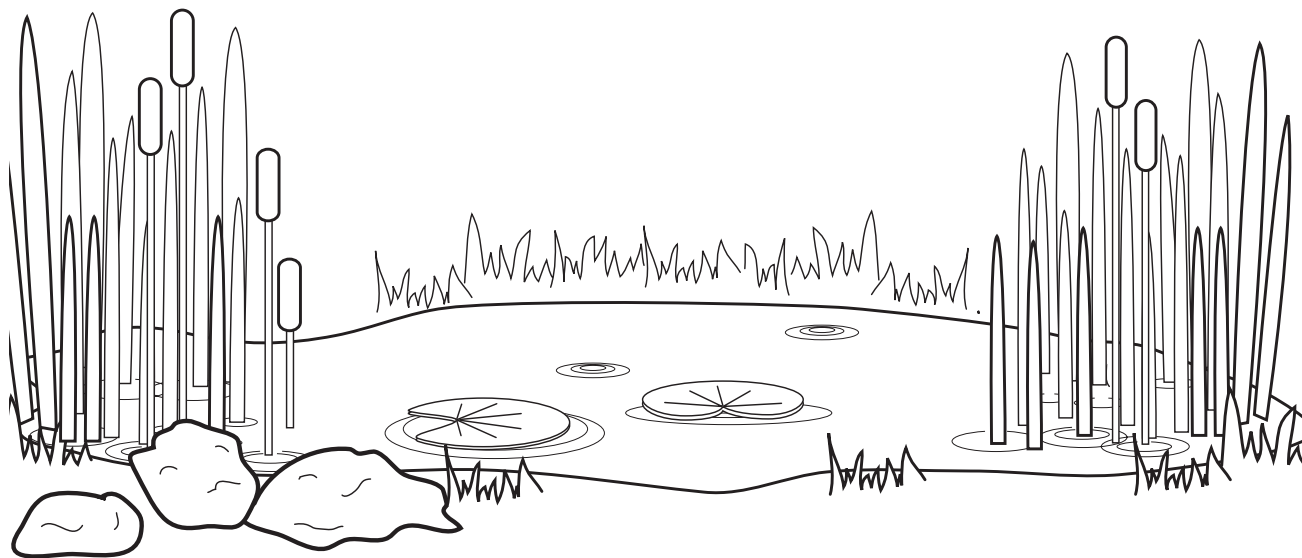




Duck Storyboard

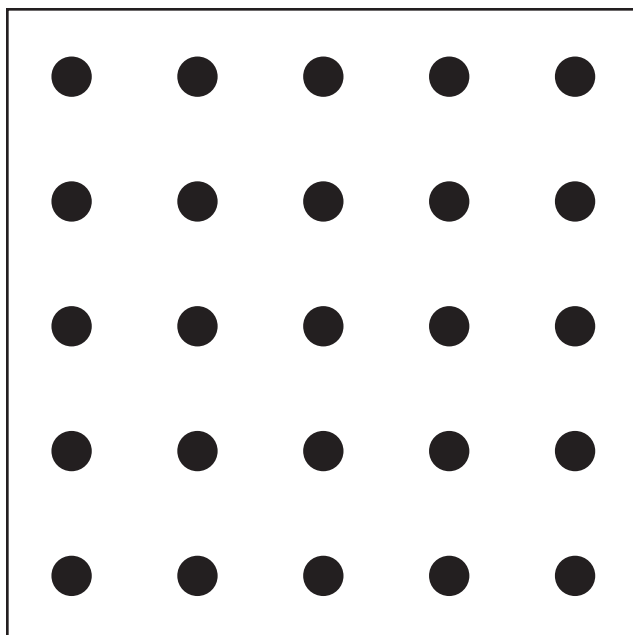
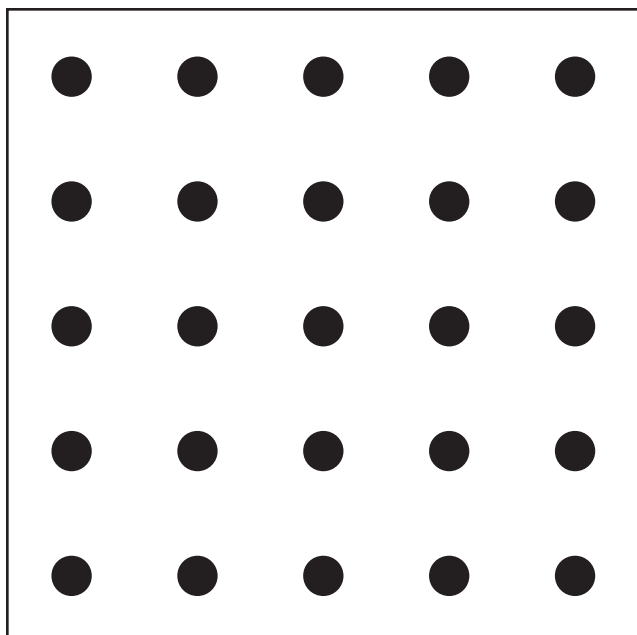


Duck Storyboard



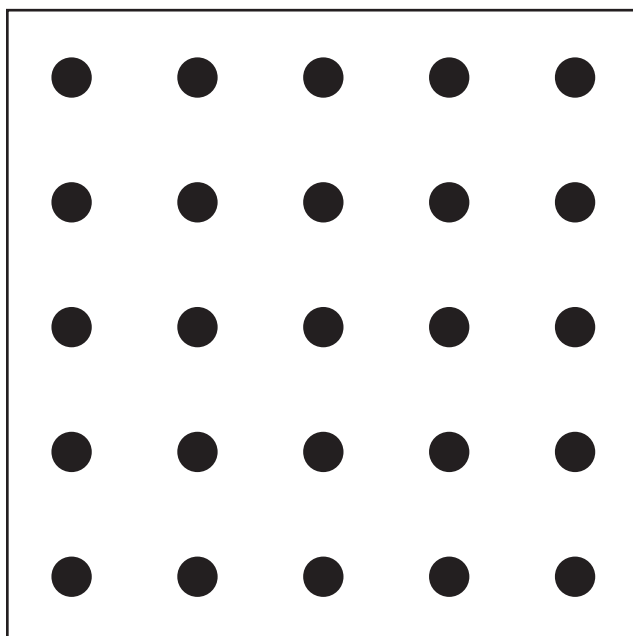
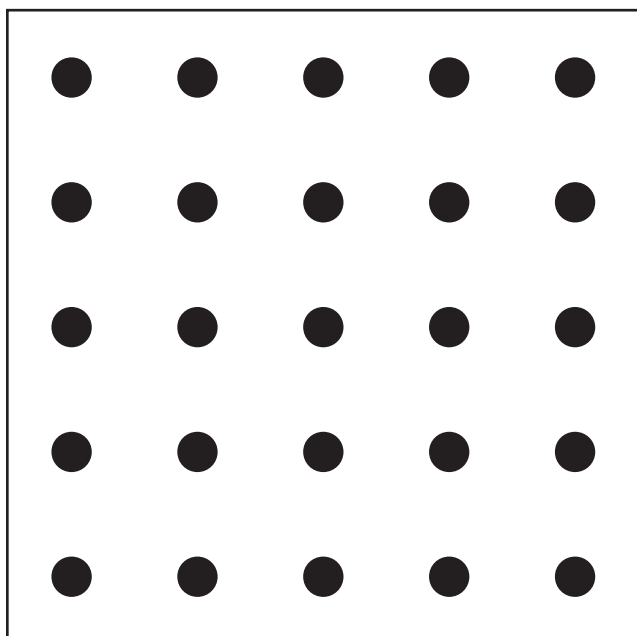
Doubled Duck Match Recording

Geoboard Doubles Recording Sheet



$$\square + \square = \square$$

$$\square + \square = \square$$



$$\square + \square = \square$$

$$\square + \square = \square$$

Number Cards

0	1	2	3
4	5	6	7
8	9	10	

0	1	2	3
4	5	6	7
8	9	10	

Double Duck Ditty

(Sung to the tune of the Bunny Hop)

To the pond came one duck,
Then, another too.
Add them both together,
And you get 2.

6 small ducks were swimming.
6 more came to delve.
Add them all together,
And you get 12.

In the farm were 2 ducks.
Then there came 2 more.
Add them all together,
And you get 4.

7 duckies washing.
7 more did preen.
Add them all together,
You've got 14.

In the yard were 3 ducks.
Three more came for kicks.
Add them all together,
And you get 6.

8 ducks went out walking.
Saw 8 more on the green.
Add them all together,
You've got 16.

At the fence were 4 ducks.
4 more through the gate.
Add them all together,
And you get 8.

9 ducks were so hungry.
9 more looked so lean.
Add them all together,
You've got 18.

Five ducks eating dinner.
Five more came again.
Add them all together,
And you get 10.

10 ducks were dining
10 more ate plenty.
Add them all together,
You get 20.

Math Journal Problems

Print one at the top of each page for Kindergarten Math Journals.

1. Four ducks want to take a nap on their own pile of hay. If there are two piles of hay, how many more are needed so all the ducks can sleep on hay?
2. There are three ducks. Each duck has two ducklings. How many ducklings are there?
3. Five ducks are swimming in the pond. How many legs are swimming?
4. The farmer builds a house for every two ducks. How many houses will he need for ten ducks?
5. The farmer needs three sacks of food a day to feed his ducks. How many bags of food does the farmer need for three days?
6. The farmer has three friends come to help. How many hands are working?
7. Two ducks lay five eggs each. How many eggs are there?
8. The farmer is making peanut butter sandwiches for lunch for his three friends. Each sandwich has two slices of bread. How much bread does the farmer need?
9. Five ducks go flying. How many wings are flapping?
10. Two mother ducks go walking with eight ducklings. Each family has the same number of ducklings. How many ducklings in each family?

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Gulping Down Subtraction

Standard I:

Students will understand simple number concepts and relationships.

Objective 3:

Model, describe, and illustrate meanings of addition and subtraction for whole numbers less than ten.

Intended Learning Outcomes:

1. Demonstrate a positive learning attitude.
5. Understand and use basic concepts and skills.
6. Communicate clearly in oral, artistic, written, and nonverbal form.

Content Connections:

Math I-3; Separation of sets
Language Arts VIII-5; Legible numeral writing to communicate

Math
Standard
I

Objective
3

Connections

Background Information

Children learn mathematics through everyday experiences and language. When they tell stories about their own math problems, they make connections to their own life experiences and other knowledge.

Likewise, using literature to help students make connections between the real world and mathematics is a valuable tool for teachers. Literature can foster the growth of mathematical thinking through the problems presented in the stories. Problem solving strategies can be developed through mathematical discussion of literature. Talking about math through literature can help struggling students learn to communicate in the language of mathematics, a skill basic to future success in the subject.

As we use literature as a springboard for learning, questioning, and building curriculum, we build strong math learners who link a seemingly symbolic subject to the real world.

Research Basis

Moyer, P. S. (2000). Communicating mathematically: Children's literature as a natural connection. *The Reading Teacher*. 54 (3) 246-55.

Children's literature provides a context through which mathematical concepts, patterns, problem solving, and real-world contexts may be explored.

Opportunities for the development of mathematical ideas arise naturally from children's books. These daily connections are vital if children are to learn to speak and write the language of mathematics. Many children have difficulty communicating mathematically.

Teachers who promote mathematical discussion throughout the curriculum are developing key abilities in students that will serve them well in communicating mathematically throughout their lives.

Protheroe, Nancy (2004). Motivating Reluctant Learners. *Principal*. 84 (1) 46-48.

One of the most compelling strategies to motivate reluctant learners is to make learning relevant to their lives. By making connections between students' experiences and the curriculum, introducing new lessons and concepts with activities that draw on their experiences, and teaching subject matter so it is important to students will motivate the reluctant learner. Using engaging, well-written literature is one way to engage early childhood students in mathematics and help them make connections to their world and previous knowledge.

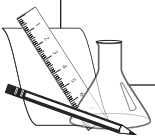
Invitation to Learn

Bring in a small bowl with hungry goldfish in it. Let the children talk about the fish. Sprinkle some fish food in the bowl and watch the fish gulp down their food. Tell the students you are going to read a story about some hungry fish who gulp down their food.

Instructional Procedures

Materials

- ☐ Ten Sly Piranhas Cutouts
- ☐ Ten Sly Piranhas
- ☐ Goldfish crackers



Ten Sly Piranhas

1. Read the Story *Ten Sly Piranhas*. Have the children help you with the repetitive verse.
2. Using the *Ten Sly Piranhas* cutouts (cut and colored, with a magnet on the back to be used on a whiteboard), have the children help you retell the story.
3. Write the number sentences as each problem in the story arises.
4. Give each child a bag of ten Goldfish crackers and have them eat one at a time as you reread the story.

NOTE: All of the following activities can be done on several levels.

1. Concrete, where objects are used.
2. Pictorially, where students draw to record what they have done.
3. Symbolically, where they use numbers along with their concrete or pictorial representations.

Ten Frame Subtraction

1. Students put a fish in each of the squares on the *Ten Frame*.
2. Students take a *Number Card* from the container and remove that many fish from the *Ten Frame*.
3. Students record their subtraction sentence on *Ten Frame Recording* paper.
4. Students repeat the procedure until they have filled in the *Ten Frame Recording* paper.

Materials

- ☐ *Ten Frame*
- ☐ Fish counters
- ☐ *Number cards*
- ☐ Small container
- ☐ *Ten Frame Recording*
- ☐ Pencil

Subtraction Toss

1. Each student puts a fish on the number ten on the *Fish Number Line*.
2. Students shake the cube and move backwards that amount on the *Fish Number Line*.
3. Students record the numbers on the recording master.
4. The first student to zero wins and the game begins again.
5. For more advanced students, make a *Fish Number Line* beginning with 20.

Materials

- ☐ *Fish Number Line*
- ☐ Fish counters
- ☐ Number cube
- ☐ *Fish Number Line Recording*
- ☐ Pencil

Graphing Subtraction

1. Students take one fish at a time from the paper sack and place it in the appropriate column on the *Fish Graph*.
2. When one column is filled, students record the numbers, find the difference, and record it on the *Fish Graph Recording* sheet.
3. When the first graph is finished, students put the fish back in the sack and repeat until the recording sheet is filled.
4. If two students do the activity, they take turns pulling fish from the sack and both record.

Materials

- ☐ *Fish Graph*
- ☐ Fish counters
- ☐ *Fish Graph Recording*
- ☐ Paper sack

Fishy Subtraction Stories

1. Students tell a story with their fish counters for each of the Storyboards.
2. Students record their number story on the white board or chalkboard.

Materials

- ☐ *Fish Story Boards*
- ☐ Fish counters
- ☐ Response boards
- ☐ Markers/chalk

Fishy Journal Entries

1. Reproduce one journal entry at the top of each page.
2. Students solve and illustrate each entry.

Materials

- ☐ Fish journal stories
- ☐ Markers/pencils

Assessment Suggestions

- Collect and assess journal entries.
- Collect and assess recording sheets.
- Have students tell and explain fishy storyboard stories.
- Observe and take notes as children participate in each activity.

Curriculum Extensions/Adaptations/Integration

- These activities are for numbers ten and under. Advanced learners can do the same activities with numbers up to 30.
- For special needs learners, take the numbers down to the zero to five range. They should work with a teacher or adult in small groups or individually.
- Science: Integrate this activity with study on fish or food chains.

Family Connections

- Students can draw the story at school and retell at home.
- Send *Ten Sly Piranhas Practice Ideas* home with each child.

Additional Resources

Books

Ten Sly Piranhas: A Counting Tale in Reverse (A Tale of Wickedness—and Worse), by William Wise; ISBN 0-8037-1200-6.

Ten Little Fish, by Audrey Wood; ISBN 10:043963561

Splash, by Ann Jonas; ISBN – 10: 0-688-15284-8

Five Little Penguins Slipping on the Ice, by Steve Metzger; ISBN 0-439-46577X

Monster Math, by Anne Miranda; ISBN 0-439-20859

Elevator Magic, by Stuart J. Murphy; ISBN 0-06-446709-0

Seven Little Rabbits, by John Becker; ISBN 10:0802796346

Ten Wiggly Wiggly Caterpillars, by Debbie Tarbett; ISBN: 10:184506027X

Developing Number Concepts Addition and Subtraction, by Kathy Richardson; ISBN 0-7690-0059-2

Articles

Developing Math Games Based on Children's Literature, by Kay M. Cutler, Deanna Gilkerson, Sue Parrott, and Mary Teresa Bowne; NAEYC www.naeyc.org 2003

Selected Book Pairs for Linking Math and Literacy, by Phyllis Whitin and David J. Whitin;
Beyond the Journal, Young Children on the Web, March 2005

Learning Math through Stories, by Stuart J. Murphy; School Library Journal, March 1999
ISSN 0362-8930

Promoting Mathematical Explorations Through Children's Literature, by David J. Whitin and
Cassandra C. Gary; Arithmetic teacher, March 1994 ISSN 0004-136X

The "Wow" Factor, by Lisa Von Drasek; www.TeachingK-8.com January 2006

Using Children's Books to Teach Math, by Marilyn Burns; <http://www.didax.com> February
2005

Web sites

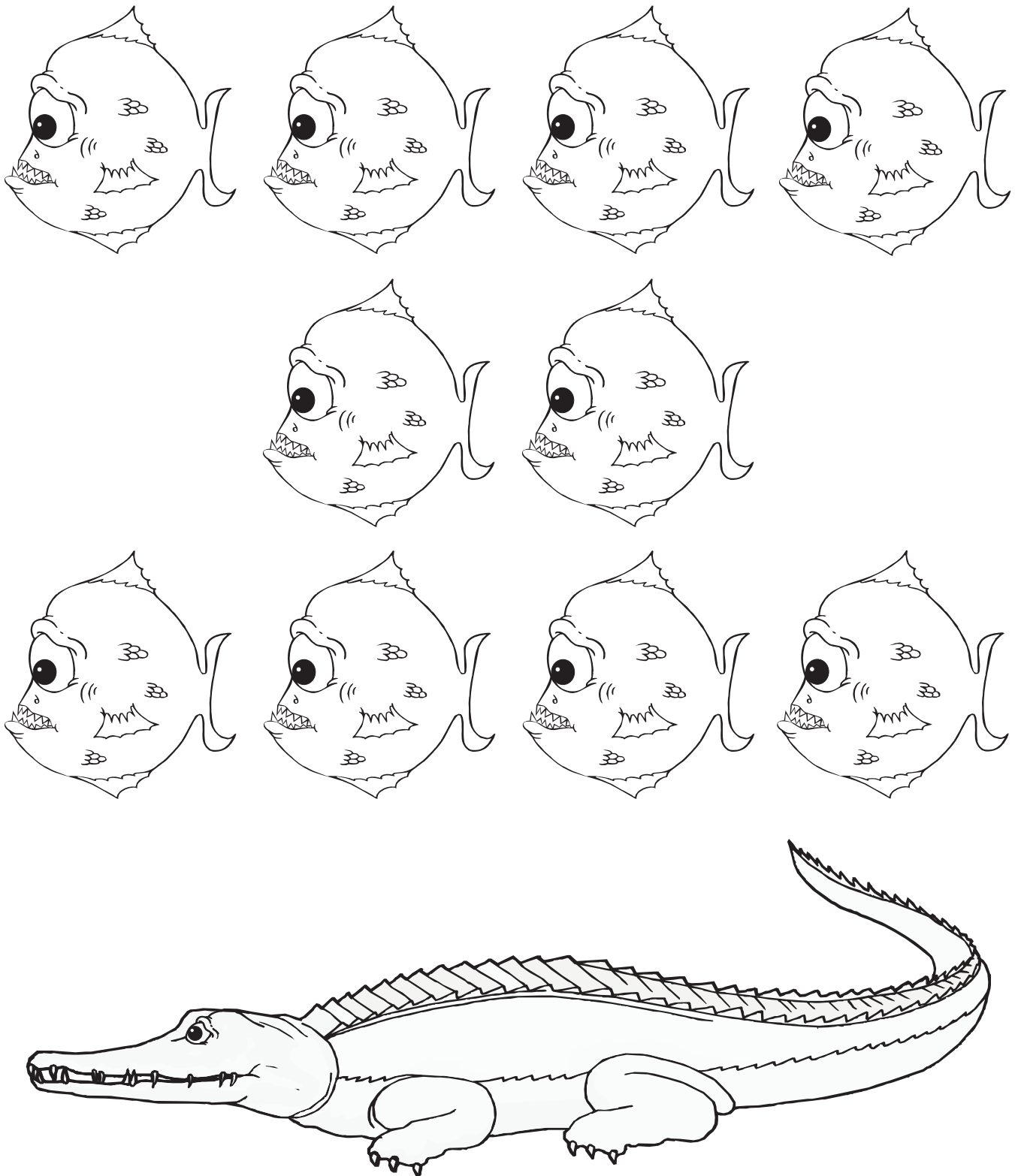
<http://www.didax.com>

<http://www.illuminations.nctm.org>

Organizations

National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-
1502 (703) 620-9840, <http://www.nctm.org>

Ten Sly Piranhas



Ten Frame

Ten Frame

Number Cards

0	1	2	3
4	5	6	7
8	9	10	

Number Cards

0	1	2	3
4	5	6	7
8	9	10	

Name _____

Ten Frame Recording

$$10 - \square = \square$$

$$10 - \square = \square$$

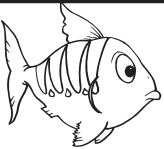
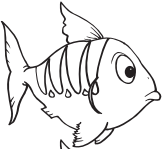







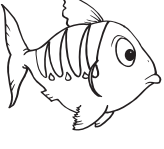
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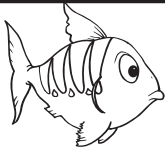
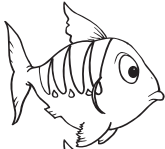







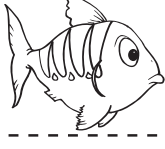
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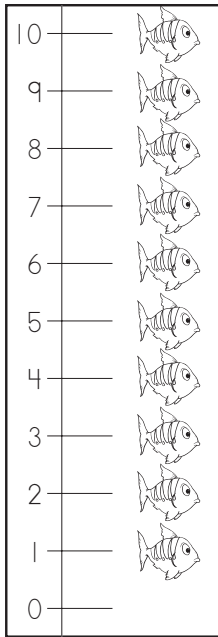
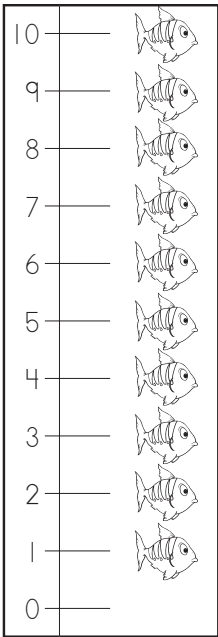
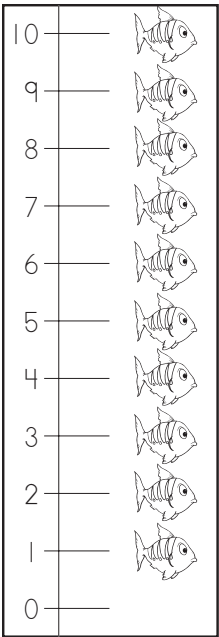
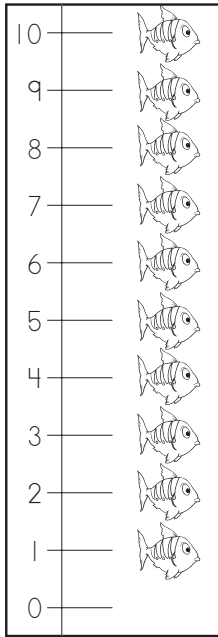
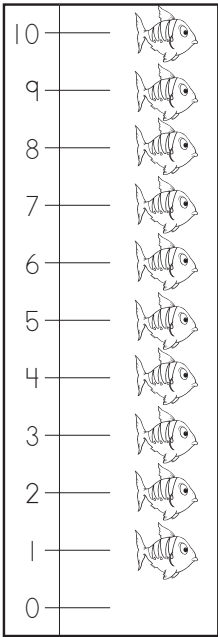
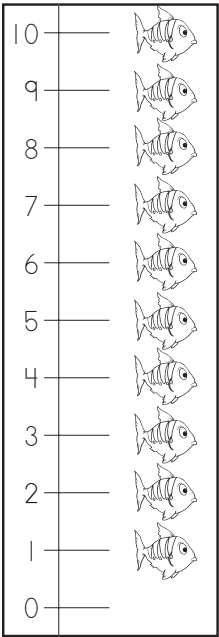
Fish Number Line

10	_____	
9	_____	
8	_____	
7	_____	
6	_____	
5	_____	
4	_____	
3	_____	
2	_____	
1	_____	
0	_____	

20	_____	
19	_____	
18	_____	
17	_____	
16	_____	
15	_____	
14	_____	
13	_____	
12	_____	
11	_____	
10	_____	Glue 10 Here

Name _____

Fish Number Line Recording



Fish Graph

Fish Graph Recording

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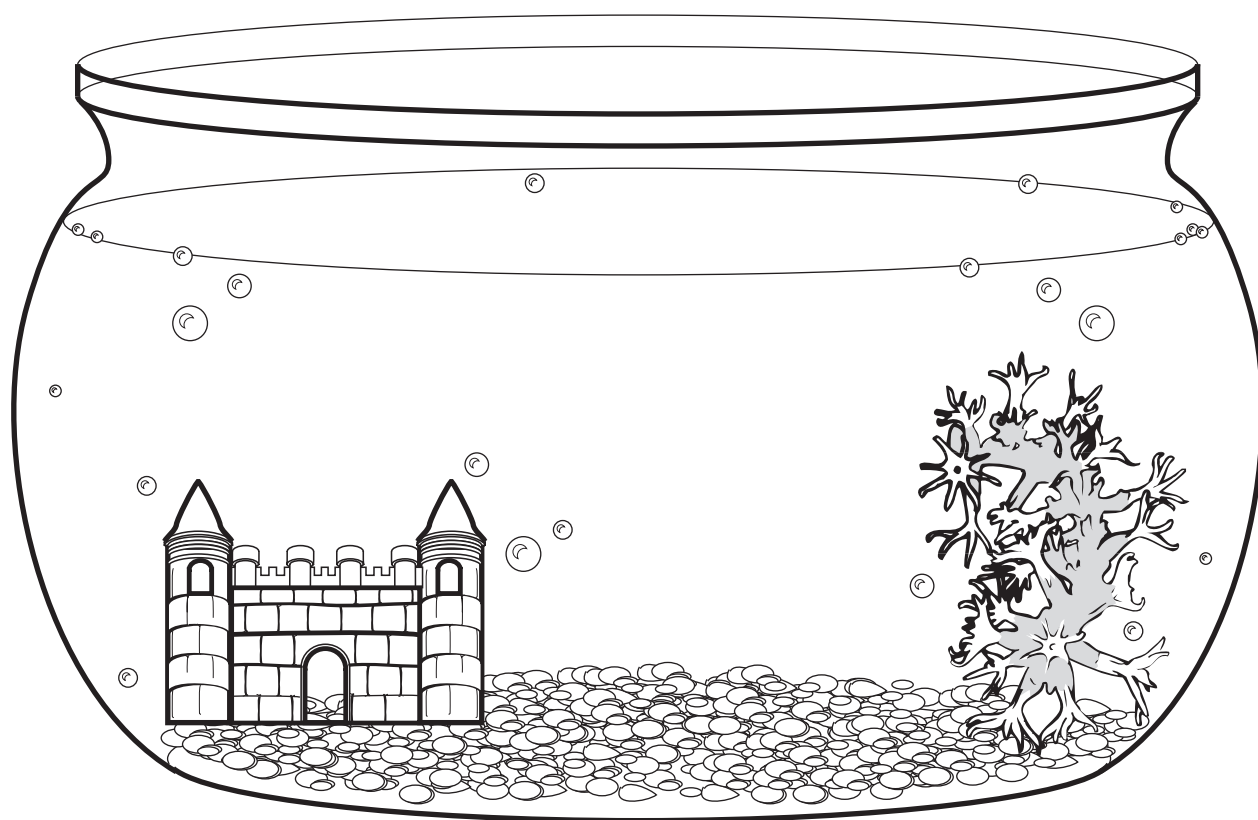
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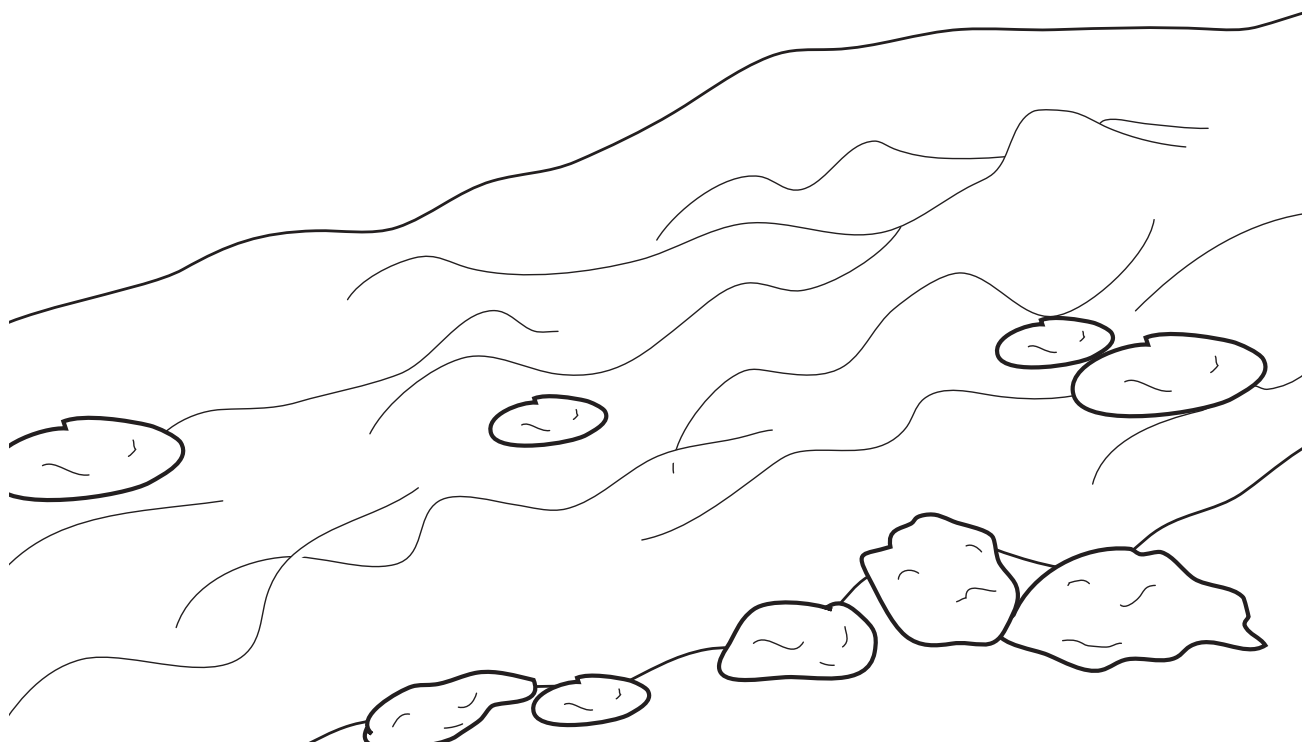
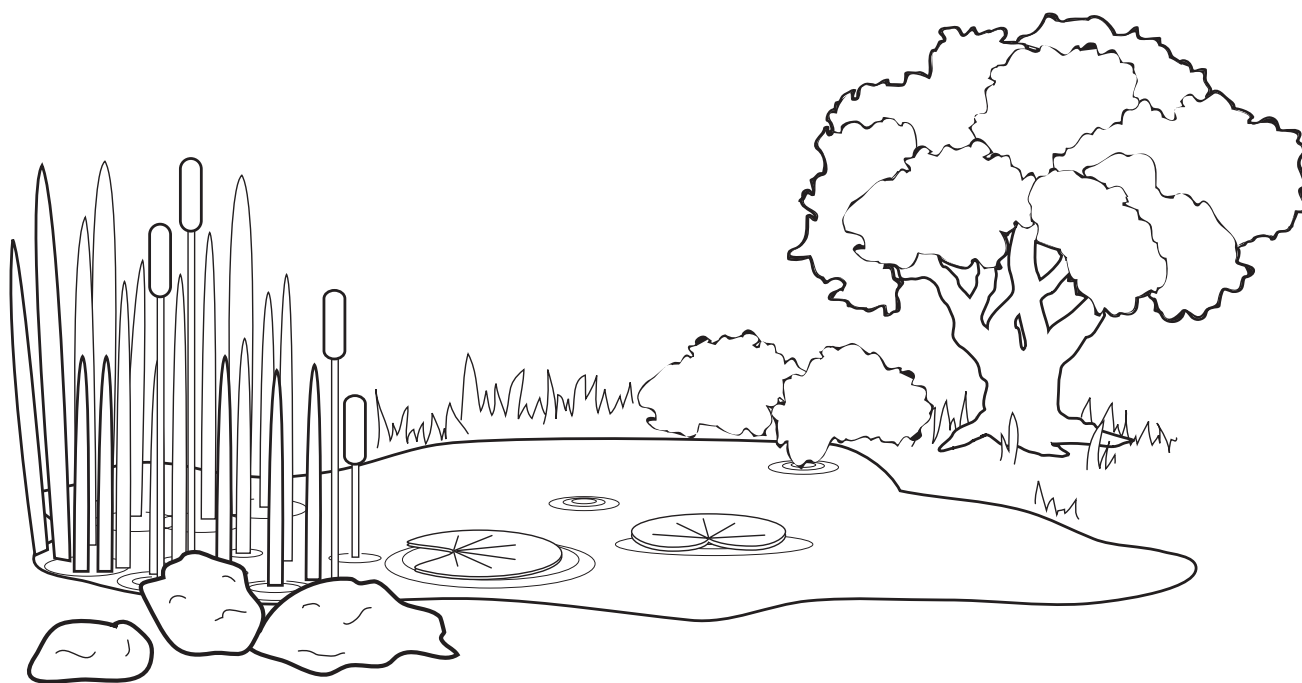
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Fish Storyboards



Fish Storyboards



Ten Sly Piranhas Practice Ideas

Dear Parents,

We have been reading the book *Ten Sly Piranhas: A Counting Story in Reverse (A Tale of Wickedness and Worse!)*. This is a wonderful story introducing subtraction.

To reinforce the concepts introduced in the book and strengthen subtraction skills, here are some ideas you can try at home with your child:

- Count out 10 Goldfish crackers and have your child “gulp” down one at a time. Talk about how many crackers there were before and after the “gulp.”
- Have your child draw a picture of a river. Have them retell the story with Goldfish crackers.
- Using 10 small items from around your home (buttons, Legos, cars, cereal) to practice subtraction.
- After practicing subtraction with the items, repeat and write numbers along with subtraction.
- Using the crackers or small items, have your child tell you subtraction stories. These are simple tales that give meaning to the subtraction process. For example: “Five birds were in the nest. Two flew away. Three birds are still in the nest.”
- Have your child make a book retelling the story of the piranhas. Let them read it to you.
- Involve your child in everyday subtraction around your home. Talk about what you are doing with them and have them solve the problem. “We need five glasses for dinner. I have three on the table. How many more glasses do I need?”

Use your imagination and have fun with your child. Math is an important skill we use everyday. Make it fun!

Thank you for your help!

Daily Math Journal

Print one at the top of each page for Kindergarten Math Journals.

1. Ten crocodiles are swimming in the river. Three climb out to rest. How many are still swimming?
2. Five sly piranhas are looking for food. They find seven fish. The piranhas each eat one fish. How many fish are left?
3. Eight frogs are swimming. There are six lily pads that can fit one frog. The frogs jump to the lily pads. How many frogs do not have a pad?
4. Ten piranhas are tired. Six go to sleep. How many are awake?
5. Two anteaters find an anthill with ten ants. They each eat four. How many ants got away?
6. Nine piranhas are swimming. Two crocodiles eat four piranhas each. How many piranhas are left swimming?
7. Seven blue butterflies land on a tree. Two iguanas each eat three. How many butterflies fly away?
8. Ten piranhas swim by two caves. Three go into each cave. How many are still in the river?
9. Eight tired turtles see six rocks to sleep on. How many turtles must still look for a sleeping spot?
10. Four bright macaws see ten beetles. They each eat two. How many beetles get away?